



FRIDAY, MARCH 23.

Contributions.

Charcoal Iron Wheels.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Are not all "cast-iron wheels" made of charcoal iron? Certainly not; if they were 30,000 miles would not be given as the average life of a "cast-iron wheel." Do you ask what the ordinary cast-iron car wheel is made of? I answer, old car wheels, anthracite iron, scrap steel, scrap iron, almost anything that will melt in a cupola, and is cheap. Do you ask if this practice is safe? Of course not, it is very unsafe, and bad economy. It is impossible to make good wheels out of poor iron. Wheels made of old wheels or other scrap iron are very properly called "shoddy wheels," as unreliable as shoddy clothes.

Why is it that railroads buy "shoddy wheels?" They are low-priced, and some shrewd men intimate that they pay commissions to railway officials to buy them. I think the chief reason is railway officers wish to buy cheap, and do not know how worthless they are. Do you ask why good old wheels may not be melted over with safety? Remelting takes away the elasticity of the best wheel iron. I have tested this. The best charcoal wheel iron which bent 14 degrees in a Thurston torsion testing machine before breaking, on being remelted once, bent only 8 degrees. This shows the great loss of elasticity in remelting, and it is all needed to carry the heavy loads in freight cars now. The only safe and economical course is to specify and require wheels to be made entirely of the best charcoal pig iron, and get a service of 60,000 miles instead of 30,000 miles.

The Report of the Buffalo Car-Builders' Meeting.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Will you please tell me through the columns of your paper in connection with this request by what authority the note was attached to the report of the Car-Builders' Meeting at Buffalo on the 14th of February? It was not on the original report, and no authority was given to attach it or anything to the report.

I ask this question because that note carries the false conclusion that there is a standard link and pin—the length of the former being fixed at 10 in. in the clear. Whereas no standard length has been adopted or even recommended by the Car-Builders' Association or any authorized committee of it.

One of the earnest desires of all railroad managers is to secure a coupler which shall prevent the necessity of men going between cars to connect them, and thus bar all injuries to life and limb. We know that there are such couplers and we know, as do the principal men of the Car-Builders' Association, that a 10-in. "link" "coupled" with the resolution, passed at Buffalo on Feb. 14 outlaws the adoption of all such inventions.

Now I ask, in the name of railroad officials, if the interests of the railroads are not thus betrayed or at least neglected by the very men who are sent, in some cases by authority, to this Association to give attention to, among other matters, this very system of coupling by which life, limb, time, labor and expense are involved. A SUBSCRIBER.
NEW YORK, March 14.

The Two Fastest Trains in the United States.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As my statement in the *Railroad Gazette* of Dec. 22, 1882, concerning the rival trains between Jersey City and Philadelphia has been justly criticised, will you allow me to modify it?

While my ranking of the Pennsylvania afternoon express west as the fastest train in the United States was strictly correct if the distance and the schedule time between termini be considered, since the distance to its new Broad street station in Philadelphia is 0.3 miles more than to Ninth and Green streets, Philadelphia, via the Bound Brook route, while the time allowed is the same as that of the morning express east on the Bound Brook, yet, considering that two more stops are made, the run of the latter train is the best performance. This conclusion was verified by a recent timing of both trains under similar conditions. While the Pennsylvania train was unable to keep to its schedule, that on the Bound Brook arrived at Jersey City almost on time. The maximum speed attained on the Pennsylvania was two miles in 59 seconds each, or 61 miles per hour. Near Monmouth Junction 17 miles were run in 19½ minutes, including slackening through New Brunswick, which is at the rate of 52.3 miles per hour. The fastest mile made by the Bound Brook train was one in 54 seconds, or 66.7 miles per hour, and the average for nine consecutive miles was 58 seconds, being 62.1 miles an hour. This was on the Central Railroad of New Jersey, but between Philadelphia and Bound Brook 15.2 miles were made in 15¼ minutes, which is 59.8 miles per hour.

The fairest comparison of the schedules of the two trains is to take the run from Wayne Junction to Jersey City on the Bound Brook and that from Jersey City to Germantown Junction on the Pennsylvania. Thus, in the latter case, 84.3

miles should be run in 1 hour 40 minutes, with one stop, being 50.6 miles per hour, while on the Bound Brook 1 hour 42 minutes are allowed for 85.1 miles, including two stops, which is 50.1 miles per hour. Excluding the time lost by the stops, it will be seen that the latter train is the faster.

A. L. ROTCH,

Massachusetts Institute of Technology.

BOSTON, March 17, 1883.

Wheel and Axle Mileages Again.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I rise to ask if any statistical gentleman will favor us with such figures as bear on the question of using "ton-mileage" instead of simple mileage as the measure of merit in car wheels and axles. Our good Mother Nature has a law which provides that expenditure is proportional to result, and *vice versa*, and in accordance with this law, it would seem that a wheel carrying three tons of load will roll and slip over only about two-thirds as many miles of rail before "expending" its available tire materials as it would if it carried only two tons of load.

If this is really, or even approximately, correct, then each of the twelve high-priced steel-tired wheels which carry a 24-ton parlor car over 450,000 miles of rails gets credit for its little 450,000 mileage, while if the same car had been mounted on only eight wheels, it would have expended their tires in running only 300,000 miles, and each of the eight wheels would score a demerit as compared with each of the jolly twelve, although they may have been of exactly the same quality.

And similarly with axles; for three tons of load jolting and bouncing on springs on each end of an axle will surely bring on an attack of crystallization in the metal in about two-thirds of the time required by the two-ton loads to effect the same result. The axle-maker who sold only four axles for that car has his profits neutralized by a bad record, while he who sold six axles gets six profits and a good record, with a plus sign to it too, unless, indeed, the wheel-maker puts in a successful claim to the good record as a result emanating from his wheel elasticity.

Careful observers will note of late years a marked decrease in the item of axle breakage in connection with fast train service. Some attribute this to the newly introduced quality of elasticity in wheel centres. Others say that it is the natural result of constant improvement in size and quality of axles, and that axles are improving at least as rapidly as wheels. Still another claim is that as twelve-wheel cars are increasing in the highest class passenger service, the loads on axles are really decreasing. Another party claim that as steel-tired wheels have flat faces and protruberant hubs, the hub and journal bearings are brought close together and almost eliminate the dangerous alternation of tension and compression strains on the fibres of axle which were produced by the usual three or four-inch interval existing between the journal and the hub of dis-faced cast-iron wheels. Still another opinion is that as steel-tired wheels are only bought by prosperous companies managed by experts, these are too expert to ever put high-priced wheels on low-priced axles, and they also follow the rule of removing axles after a safe stated service, whether they show deterioration or not. The returns are not yet all in, but enough are received to show that the safety percentages cannot all be given to either the wheel-makers or the axle-makers.

Our English cousins are now very much pleased with their 48-inch steel-tired wheels, and a veritable 42-inch steel-tired "boom" seems to be impending with us; but would it not be well for us to be "off with the old love before we are on with the new," and eliminate cast-iron from our large high-class wheels as we have done from our large high-class bridges? A 42-in. plate wheel in cast iron with chilled tread evidently won't be safe on account of excessive shrinkage strains. An open-spoke, cut rim, cast-iron centre with steel tire is opposed by the fact that we are beginning to make driving-wheels with wrought-iron centres. Less than a month ago I saw a split cast-iron hub in an otherwise excellent 42-in. steel-tired wheel. It was burst in a wheel press while being pulled off its axle, but before going to the press to get its gauge changed; it had been on the road for some time, and none suspected that it was all the time strained almost to the limit of its very small factor of safety.

INGENIEUR.

Legislative Criticism of State Railroad Management.

Where there is a state railroad system, the legislative body takes the place of the stockholders. The reports of the officials who manage the railroads are made to it, and it determines what shall be done with the profits which companies divide among their stockholders and what appropriations shall be made for extensions, improvements, additions to rolling stock, etc., and naturally, it does what stockholders do not often do, by criticising the accommodations granted to the public and the treatment of employes, etc. It is as if the stockholders included all the patrons of the road.

As an example of the questions raised by legislatures of countries which have a state system, we translate below a summary of a debate at a session of the German Imperial Diet on the occasion of the submission of its estimates for the year.

The work of this Bureau, however, is one of supervision and not of administration, though most of the railroads which it supervises are state railroads. This debate was held Jan. 26, at the second reading of the salary or civil list of the Imperial Railroad Bureau. We translate the abstract of the debate given in the *Journal* of the German Railroad Union, in which the speeches are arranged according to their

subject-matter rather than in the order in which they were made:

On the government benches were present, among others, the privy-councillors Körte, Kraft, Dr. Gerstwer and Streckert, of whom, however, only the first took part in the debate.

At the opening of the debate, the representative from Baden, von Göler (conservative) first called attention to the connection between the extra trains on Sundays and holidays, and the overworking of the railroad employes with the railroad accidents, as was set forth in the recent accidents at the Heidelberg station and at Hugstetten. The railroad employes were greatly exhausted on Sundays and holidays by the many extra trains. It occurred in some instances that switchmen and engineers were obliged to work 16 and even 19 consecutive hours on Sunday, and in the event of an accident occurring, they were held responsible; where the moral responsibility rested would be clear to everybody. In addition to these trains were only an encouragement of the pursuit of pleasure. The influence of the Imperial Railroad Bureau in this direction was not very great, but it was to be hoped that the above suggestions would have effect. To this, Privy Councillor Körte replied, that excursion trains had been introduced by the different managements without the knowledge of the Imperial Railroad Bureau, but at the urgent wish of the public. Restrictions could be imposed only by the local governments. The Imperial Railroad Bureau could only take action in the premises as far as was covered by an order issued in the year 1875. In this order it was prescribed that the administrations in fixing the working hours for the operating employes should, while providing for the control and safety of the operation, have proper regard for the well-being of the men, and that, especially, opportunity should be furnished them, as far as possible, to fulfill their religious duties. Complaints on the part of the clergy that this had not been done had occurred in isolated instances prior to the issue of the order in question, but not since. In the case of the Heidelberg accident on the 29th and 30th of May, 1882, no possible proof of overwork was produced on the part of the guilty switchman before the government commission of investigation. He had been on leave of absence on the 29th of May, from 6 o'clock in the morning till 6 o'clock in the evening, and in violation of orders did not return to his post until 7 o'clock in the evening. About 10 o'clock, and without any other than his own authorization, he had handed his post over to a substitute and betaken himself to a drinking house. In the same manner, in the case of the Hugstetten accident, which was still under investigation, nothing had so far been developed that would furnish grounds for the belief that it was caused by overwork on the part of railroad employes. The train had started from Colmar Sept. 3, at about 8 o'clock in the morning, had reached Freiburg soon after 9 o'clock, and had remained there till 8 o'clock in the evening. The employes had had the entire day in which to observe their religious duties. would be seen from the foregoing facts, that the Imperial Railroad Bureau had devoted full attention to the subject.

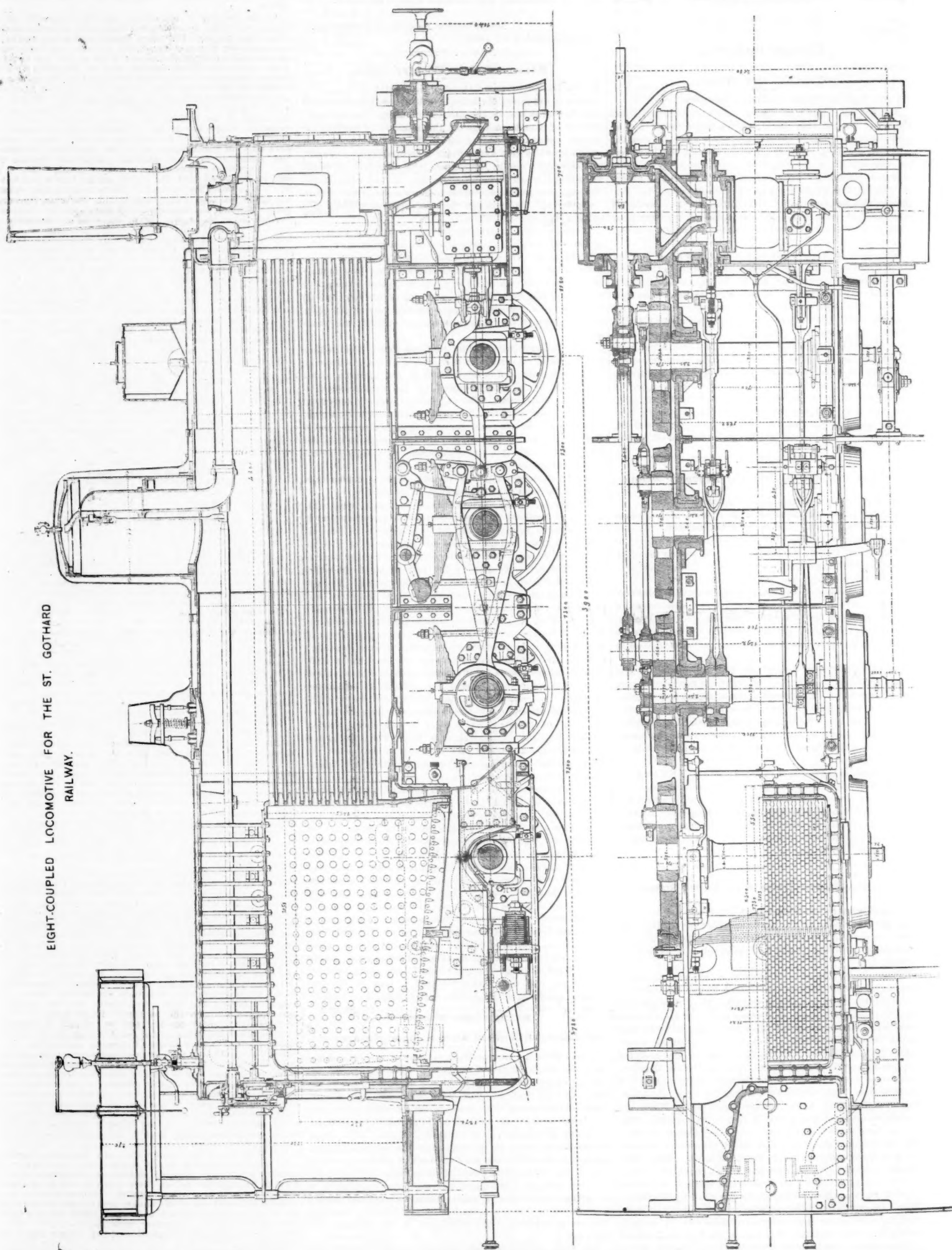
Representative Gerwig (national liberal, Director of Construction of the Baden Railroad) expressed himself as deeply affected by the railroad accidents, but he failed to see how they had any relation to Sunday observance, was it simply because they occurred on Sunday? The extra trains entailed increased danger, and the administrations would gladly avoid them; they were, however, urged to continue them by the public. In the case of the accidents above quoted, no blame could be laid on the railroad managements, nor could it be traced to the overworking of employes, as suggested. This was proved especially in the case of the Hugstetten accident, by the published report of the government investigating commission, who had arrived on the ground the next day; and this was further clearly demonstrated in the course of the subsequent judicial inquiry. The care with which the officials control their employes renders any application of the spur of parliament unnecessary.

Representative Reichensperger (clerical) expressed a desire for a gradual limitation of Sunday traffic, and pointed to England as an example, where, although the Sunday prohibition of public meetings was the cause of much just opposition, the limitation of railroad traffic was generally approved. Representative Schrader (liberal union), as a former railroad director, corroborates on the whole the remarks made by Representative Gerwig with regard to Sunday excursion trains. They are by no means desired by the railroad administrations, but are regarded as a necessity, as the major portion of our population is unable to use week days for such purposes. Even in England, the introduction of Sunday excursion trains has begun. The Sunday rest for employes he would favor, but it could be attained by increasing their number.

Representative Kayser (social democrat) declared himself grateful to Representative Göler for bringing the subject of railroad accidents and the needs of railroad employes up for discussion. The latter are always made the scapegoats when an accident occurs, while the officers remain tranquilly in their positions. In the case of the Heidelberg accident, a switchman had been consigned to a cell, while there was also a certain amount of guilt attached to the administration, as the Mannheim National Court had plainly set forth in its decision. The subordinate railroad employes were all overworked, and especially in Baden and Saxony. He asked the Imperial Government, which had always declared its readiness to protect the poor man, to reduce the railroad employes' hours of labor. The first requirement for this purpose was statistics respecting their working hours. His party was in favor of Sunday rest for officials, but would, at the same time, furnish the laborer with Sunday extra trains to afford him a means of open-air recreation. Exhausted human beings were no more trustworthy than worn-out rolling stock. He would advise a decrease of the freight traffic on Sundays, and in place of the extra trains, perhaps an enlargement of the regular passenger trains would suffice. In other respects, the private railroads thought only of their profits; only in the case of state railroads was safety made the preponderating object. The safety of travel could only be insured if the Imperial Railroad Bureau would energetically apply itself to the improvement of the condition of the subordinate railroad employes. Representative Witt was of the opinion that any limitation of railroad travel on Sunday would receive very little favor in country places; the English observance of Sunday could form no example for us, as there were no class of small landed proprietors in that country. Representative Dr. Luigens (clerical) was of the opinion that the introduction of the state system of railroads had caused much evil and very little that was good. Together with Representative Niehammer, he advocated a limitation of the freight trains on Sundays.

The second principal subject of discussion was the rates. Representative von Göler opposed the existing rates as too high, and quoted the Imperial Chancellor's statement in support of an assertion that the railroad rates offered a premium on imports which exceeded the custom dues three or

* Local government means in this instance the government of the country concerned—Prussia, Saxony, Baden, etc.—as distinct from the Imperial government.

EIGHT-COUPLED LOCOMOTIVE FOR THE ST. GOTHARD
RAILWAY.

four times. In America, domestic production was stimulated by the rates, and that should be an example for Germany. Grain paid from Chicago to New York, per ton and kilometer, 1 to 2 pfennigs [= 0.355 to 0.71 cents per ton per mile, or 17 to 34 cents per 100 lbs. from Chicago to New York]; on the other hand, from Berlin to Hamburg 6.5 pfennigs; from Leipzig to Hamburg 6.6 pfennigs, or five or six times as much. The transportation of butter from Moscow to Hamburg was 1 mark cheaper than from Eastern Prussia to Hamburg. All this was detrimental to German agricultural interests, which were in a hopelessly depressed condition. German state and private railroad administrations, like wholesale merchants, had only their own financial interests in view instead of great public interests. In accordance with the imperial constitution, the Imperial Railroads Bureau could do no less than endeavor to effect a reduction in rates. Privy Councillor Körte pointed out that on the revision of the tariff in 1877, the governments of the confederation had resolved that rates, which might injure Government trade, agriculture and manufactures should be avoided, and that changes of rates which might give foreign produce and fabrics a better market than similar domestic productions should be subject to the approval of supervising officials working in conjunction with the Imperial Railroad Bureau, the confederated governments have unanimously resolved, not to approve the introduction of differential rates for international traffic, except when there is no danger of injury to German industrial interests, or when other branches of industry, and especially the interests of German commerce and of inland consumption, demand the differential rates. These principles were still in

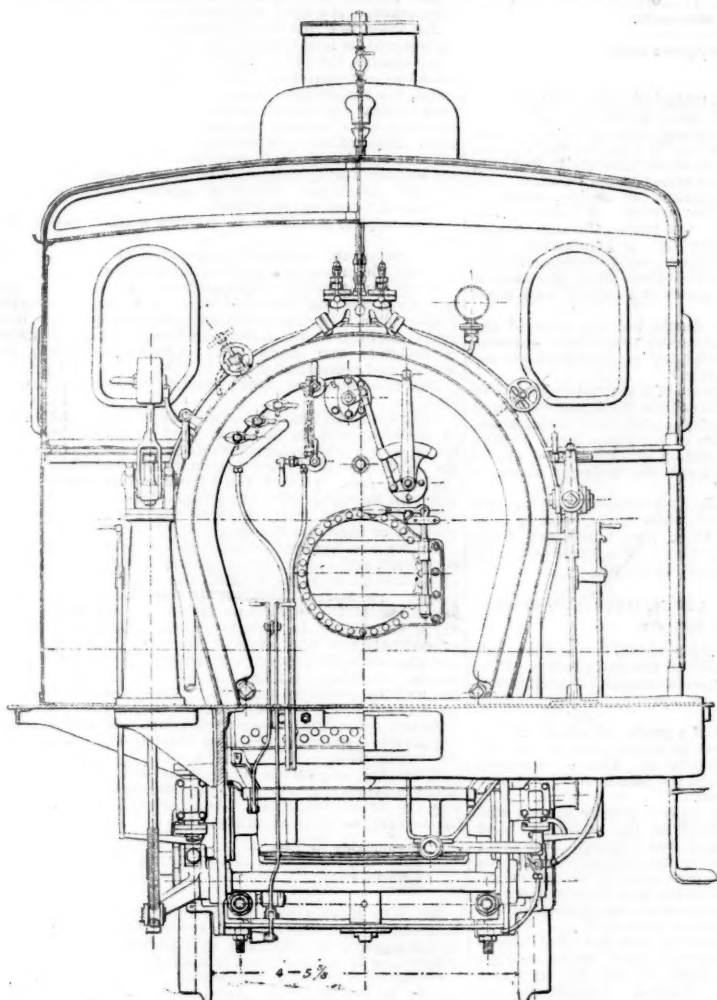
the lower rates to the Rhine have caused more grain to be imported on the Rhine than ever before. Therefore this policy had had no practically beneficial results. The Prussian Minister of Public Works has been compelled to reduce to a considerable extent the freight charges on grain from Russia to Königsberg, below even the rates previously established. By the means proposed, therefore, we only injure the traffic across the country, without increasing the cost of importation. During last year there were negotiations at Breslau respecting the freight charges to be established on grain transported from Roumania and Galicia to Stettin. The export representative sent on by the Minister of Agriculture at first protested against the establishment of a lower rate, so as to avoid injury to the Silesian export trade. But as it appeared that Silesia could no longer feed its own inhabitants, the Minister himself was compelled to signify his assent to these rates. It is to be hoped that the Minister will not gratify the wishes of the opposition. The interests of the railroads and of the other industries of the nation are entirely congruent; only an artificial distinction can be drawn between the interests of the national economy and the transportation interests of the railroads. Representative Von Göler appeared to be as little acquainted with circumstances in America as with German agriculture. Where cheap importation is desired, the railroads must be given the greatest possible latitude of action compatible with their own interests. As in every other producing industry, the interest of each industry must regulate the price from its product. When it is to the interest of the railroads to carry grain cheaply, we should not seek to retard them in their undertaking.

The general dimensions of this set of engines are as follows:

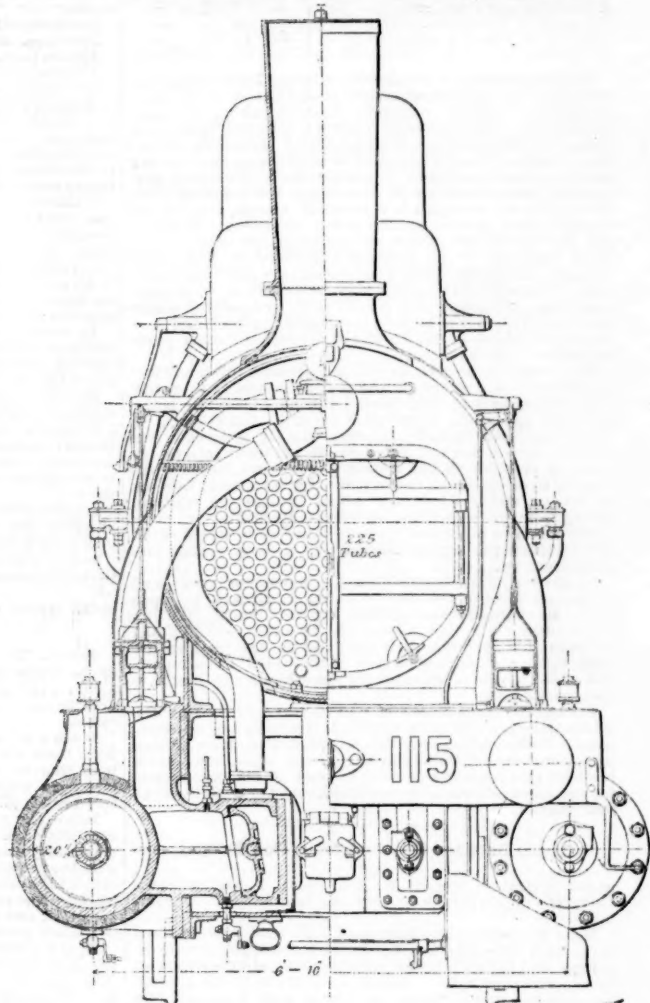
Fire-grate:—Length.....	7.0 ft.
Width.....	3.31 ft.
Surface.....	53 sq. ft.
Tubes:—No.....	225
Outside diameter.....	1.97 in.
Length between tube plates.....	13.78 sq. ft.
Heating surface:—Fire-box.....	102 sq. ft.
Tubes.....	1,000 sq. ft.
Total.....	1,702 sq. ft.
Boiler:—Mean diameter of shell.....	5.04 ft.
Total length, with smoke-box.....	24.42 ft.
Height of centre line above rails.....	6.89 ft.
Pressure.....	149 lbs.
Frames:—Thickness of plates.....	1.38 in.
Axes:—Diameter of journal.....	7.87 in.
Length of journals.....	9.45 in.
Wheels:—Diameter of tread.....	3.84 ft.
Engine:—Diameter of cylinder.....	20.40 in.
Stroke.....	24.00 in.
Diameter of crank pin, driving axle.....	5.12 in.
Valve gear.....	
Weight:—Empty.....	44.0 tons.
In working order.....	50.8 tons.

These figures show very clearly the great power of these engines, having practically 20-in. cylinders and 2 ft. stroke, with the high working pressure of 150 lbs. As an illustration, it may be mentioned that the work done by one only of the two cylinders at each stroke would be about 1,000,000 foot-pounds, or equal to the whole amount stored in the Four battery, which made such a sensation when conveyed from Paris to Glasgow not many months ago.

The general specification of these engines was the same as



EIGHT-COUPLED LOCOMOTIVE FOR THE ST. GOTHARD RAILWAY.



Eight-coupled Locomotives for the St. Gothard Railway.

Last week we published a side elevation of this engine. This week we give a longitudinal section and plan, and transverse sections showing the construction of the engines. These, and the following description, are copied from the London Engineer:

These engines are of the Class D, and are excellent examples of continental work. The engines were built by Messrs. Maffei & Co., of Munich, from the designs of Herr J. Stocker, Locomotive Superintendent of the St. Gothard Railway. The design is founded upon the eight-coupled mountain engines of the Southern Railway of Austria, the Upper Italian Railway and the Paris & Lyons Railway—the latter used for the Mont Cenis—but with considerable modifications, which are due to Herr Stocker himself. The arrangement of the trailing axle below the fire-box, with a special disposition of the springs, to enable the fire-box to be properly supported, is a novelty. The steadiness of the engine at high speeds is thus greatly improved, and this was a matter of much importance in order that the engines might run at a sufficient speed through the great tunnel and elsewhere. The whole engine is made as short as possible, in order that the overhanging weight beyond the short wheel base, rendered necessary by the curves of the line, may be as small as is practicable. Another point of novelty is the construction of the rear part of the boiler, which is more on the American pattern.

The whole of these 15 engines were at work by June 1, 1882. The specification stipulated that they should be able to haul 150 tons on a gradient of 2.7 per cent., but this has been frequently exceeded. It has already happened that two of these engines have hauled a train of 410 tons over the mountain section of the St. Gothard, at a speed of 9 to 12 miles an hour; while on the valley section, with gradients of 1 in 100, one engine easily hauls 500 tons at 15 miles an hour. The directors of the St. Gothard Railway are perfectly satisfied as regards both their working and construction.

force, and were calculated to cover the desires expressed by Representative von Göler.

Representative Schrader expressed his surprise that complaints respecting the rates should proceed especially from the advocates of the system of state ownership of railroads. But these complaints overshot the mark. Lower rates would not benefit domestic productions alone; they must be made uniformly operative and would only tend to increase the competition on the part of foreign producers. The act of the Federal Council above quoted, refusing to grant foreign goods a lower tariff than domestic productions, had gone as far as was possible. A reduction of the rates, such as was demanded by Mr. Von Göler, would seriously affect the solvency of the railroads, would require increased accommodations and load them down with liabilities in the shape of interest. That the agricultural interest are in such a depressed condition as Mr. Von Göler states, the speaker is not prepared to confess. Representative Buchtemann replied to the statements of Representative Von Göler, that to the friends of the latter gentleman everything in the way of railroad policy that could produce or retard the introduction of the so urgently necessary foreign grain, was "national." This was really no national but an agrarian view to take of the subject. Representative Von Göler, as would be observed, directed his attacks especially against the transit trade and the differential rates. The remark made by the imperial Chancellor, however, to the effect that the railroad rates acted as a premium on imports equal to double, treble or quadruple the amount of the duties was incorrect. There have never been railroad freight rates from foreign ports on which the share of the German railroads has been as much as one mark less than their regular rate, and that would be about double the customs duty. Bavaria has been prevented from attracting by differential rates the trade of Hungary to Switzerland and Hamburg from profiting by trade between Hungary and England and the Rhine country from supplying itself with Hungarian grain. The consequence is that this year Bavaria has been compelled to restore the former transit tariff at lower rates than before and, secondly, that the Elbe River traffic has assumed hitherto unknown proportions and freight charges on the Elbe are cheaper than ever. Finally,

for the other types built for the St. Gothard Railway. It presents several points of interest as compared with the ordinary specification of an English locomotive, and we therefore give an abstract of it. Omitting the mere general and ordinary conditions, the main features are as follows:

The locomotives and tenders are to be constructed according to the dimensions given for each particular class, and the general drawings annexed. All detail drawings which may be required are to be made by the contractor. Before beginning the work he is to lay copies of these and of his general drawings before the managers of the railway. Any alterations required by them are to be made by the contractor, and the drawing when approved will remain with the company and form the basis of the contract. In addition, the contractor, at the end of the contract, will supply a complete set of drawings to one-tenth scale of the engine as built—elevation, longitudinal section, horizontal section, and cross sections through the fire-box and smoke-box—and with all the chief dimensions written upon them. The materials are to be of the best quality; the works supplying them are to be named in the tender, and proof must be given when required that these works are really employed. Tests of strength will be made by the company before use, either in the works of the contractors or in some proving-house which they may select. The tests will be at the cost of the contractor. The various parts will be made of the following materials:

- Of crucible steel: The axles, both locomotive and tender; the tires for the locomotives, the eyes for all the eye-bolts.
- Of cast steel: The tender tires, the springs, leaf and spiral; the pistons, the slide-bars, the axle-box guides with their keys, and the screwed rods for the valve gear.
- Of cast iron: The cylinders and covers, the slide valves, piston rings, steam pipes, grate-bars, brake-blocks, and all parts of support and construction.
- Of copper: The inner fire-box, the horizontal stay-bolts, all pipes for steam and water, including those in the smoke-box, the ends of the tubes in the fire-box tube-plate, the sanding and the lubricating pipes.
- Of brass: The cocks, valves, bearings, regulator slides, the nuts of the valve gear, screws, including all valves and valve spindles which are in contact with steam.

F. Of plate iron: The boilers, frames, foot-plate, sides and roof of the cab, cleaning plates, the tubes—charcoal iron—and the tanks for water, coal, etc.

G. Of wrought iron: All parts not otherwise specified, such as the wheel skeletons, the crank pins, connecting rods, axle-boxes, fire-box frames, valves rods, etc. The crank pins, the crosshead bolts, the ends of the connecting and coupling rods, the axle-boxes, etc., are to be case-hardened to a depth of at least 0.08 in. The connecting and coupling rods are to be forged from one piece.

The materials are to be subjected to tests of strength and ductility, as given in the table below. The test pieces are to be cylinders of 200 mm. in length—say 8 in.—and at least 200 mm. diameter—0.8 in.:

MATERIAL.	Stress which is not to exceed (i.e. mm. sq.)		Minimum breaking strength.		Minimum elongation.	Minimum contraction of area.
	kg. pr. sq. mm.	pr. sq. mm.	kg. pr. sq. mm.	pr. sq. mm.		
1. Crucible steel axles.....	26	55	18	35	35	—
2. Crucible steel tires.....	35	65	15	25	25	—
3. Bessemer steel tender tires.....	30	60	15	30	30	—
4. Boiler plate lengthwise.....	20	36	15	—	—	—
5. Boiler plate crosswise.....	18	34	12	—	—	—
6. Rivet and stay iron.....	20	36	18	—	—	—
7. Copper for fire-box and stay-bolts.....	7	20	45	—	—	—

The spring steel is to be made into a spring 1 metre long, and hardened, and must then be bent with a stress of 76 kilogrammes per square millimetre, without taking any permanent set. The tubes must sustain a pressure, inside and outside, of 20 atmospheres, without any permanent alteration of form. The various parts of each engine and tender must be interchangeable, especially the axles, axle-boxes, springs, pistons, cross-heads, connecting and coupling rods. The screws are to be on the Whitworth system, and are arranged in sets, so as to require as few spanners as possible. All nuts within the boiler or smoke-box are to be locked. Nuts requiring to be frequently unscrewed, and other wrought iron parts exposed to friction, are to be case-hardened. The eyes of all eye-bolts are to be bushed with hardened rings of crucible steel, forced in by hydraulic or screw pressure. They are to be kept from turning round, and provided with means of lubrication, as are also all other parts exposed to wear by friction.

The work is to be done under the inspection of an officer appointed by the company, and the contractor is to notify to the company the commencement of work upon the boiler and other important parts, such as axles and springs, in order that they may be inspected during progress. The boiler is to be tested by water to 50 per cent. above the working pressure in the inspector's presence. Before the putting in of the tubes, one out of every 50 is to be selected for testing, and if it fails the whole lot may be rejected. Every spring is to be tested by a lever apparatus, to carry in the middle a dead load corresponding to a stress of 76 kilogrammes per square millimetre, without taking any permanent set.

On delivering the locomotives, the contractor must send in the statement of the exact weights which will be upon each axle of the machine and tender, both when they are quite empty and when there is 6 in. of water above the roof of the fire-box, and the water tank and the coal bunkers are quite full. A detailed statement of the weight of each part, and of the weight of the separate materials composing it, is also to be given.

The engine, when delivered, will be expected to run 400 kilometres—say 250 miles—before it is accepted by the company. There will be, however, a deposit of caution money by the contractor, which will be returned when the engine has been two years in service or has run 30,000 kilometres; for the axles, wheels, tires and crank pins the period will be four years.

On the Care and Maintenance of Iron Bridges.

[Paper by Henry D. Blunden, M. Am. Soc. C. E. read before the Society Oct. 18, 1882, with discussion by Theodore Cooper, M. Am. Soc. C. E.]

Many valuable papers have been both read and discussed before this Society on the design and construction of iron bridges, but of their care and maintenance after erection we have heard very little. Indeed, it seems to be the prevailing opinion, among almost all classes that when an iron bridge is once erected, painted and the floor down, it is to last forever, requiring no care except an occasional coat of paint; and as an omission of this latter does not immediately affect the strength of the structure, is frequently neglected.

After a close examination of a large number of bridges in different parts of the state during a period of nine years, I am satisfied that they are invariably shamefully neglected.

As a general rule, the immediate care of iron bridges is left to men who know nothing either theoretically or practically of the design or manufacture of the structures they look after. To screw everything up tight seems to be the order of the day, regardless of consequences. If a rivet becomes loose they replace it—perhaps the same rivet two or three times in as many months—seldom asking why such rivet becomes repeatedly loose.

Some of these causes of undue wear and tear to bridges are as follows:

The ties not having an even bearing on the stringers, with rails not properly spiked to the ties. The result of a passing load, with this condition of affairs, is a constant pounding, first from the rail to the tie, and then from the tie to the structure. Imperfect track at the bridge approaches, and too large openings at rail joints immediately on the bridge are often the causes of very severe shocks.

The expansion gear (rollers, etc.) is generally out of sight and hardly ever kept clean. Insufficient freedom is often the cause of serious trouble. The writer, in 1875, saw the fixed end of a 180-ft. span, double-track railroad bridge push the granite pedestal to which it was bolted into the back wall, on account of the free end being blocked by the fixed end of the following span.

Improper anchoring down of the fixed end is another source of trouble, especially if the bridge be on a grade. For instance, in a double-track, two-truss, through bridge, the tendency is for one of the trusses to move in the direction of the traffic, the other remaining nearly stationary; in such a case the lateral system has a good deal more to do than it was designed for.

Poor masonry is also the cause of much mischief. No amount of anchoring or care with the rollers is of any use, unless the masonry be in a condition to resist the thrust of expansion and contraction of the structure.

The free action of friction rollers is often blocked by the accumulation of dirt in front of and around them; cinders ground to powder by the action of the rollers will, after being moistened by rain, form a concrete so hard that a hammer and chisel are required to remove it. If this is not

frequently done the movement of the rollers will eventually be prevented, and the truss must then buckle, slide on top of the rollers, or move the bed plates.

Cast-iron pedestals are often so constructed that drain-holes are necessary. When these holes are over the rollers they invariably become channels for all kinds of dirt as well as water.

Imperfect, or rather uneven adjustment of the laterals will give a wavy motion to the trusses under passing loads, causing a working at the joints. This is especially dangerous with cast-iron chords or wrought-iron chords with cast joint boxes.

In bridges with floors suspended from U bolts, severe shocks are often given to the structure by the uneven bearing of the cross-beam on its seat. If the hangers be in pairs, unless most carefully tightened up and the seat given a uniform bearing, one pair will carry by far the largest part of the load. The same trouble occurs with the stringer seats on the cross-beam.

The over tightening-up of the counters will relieve the main rods and chords of a part of their dead load. Under this condition of things, on a load being applied, the counters are improperly strained, and the main rods and chords receive more or less shock, ending in the final breaking of the counter. If the chords be not properly packed, a chance is given for the eye-bars to move; the result of this is either the cutting of the pin or the distortion of the pin-hole.

The writer tested a sample cut from a counter broken under the above-mentioned conditions, with the following results:

Ultimate, 44,000 lbs. per square inch.
Fracture, large crystals.
Elastic limit, 36,000 lbs. per square inch.
No elongation.
No reduction.

Although corrosion may not materially affect the strength of a bridge for many years, it most assuredly will in the long run. The writer, in the case of one railroad crossing over another, removed from a 3 in. by 1 in. flat bar of iron, in the bridge, scales almost $\frac{1}{2}$ in. thick; this bridge had only been erected ten years, and had been painted twice.

Without going into the question of design, there is one point that appears to the writer as faulty. For instance, in a double-track, two-truss, through bridge with four parallel stringers, it is customary for the truss pedestals to rest on friction rollers at one end, and to be bolted to the masonry at the other, while the ends of the stringers rest upon sliding plates or a timber wall plate bedded on masonry.

To obtain uniform results, should not the ends of the stringers rest upon a beam connected to the end pedestal, thereby throwing the entire weight of the structure on the two fixed and two movable points?

False economy is often the cause of a very poor floor. For the sake of saving a few pounds of iron, the flange section of a stringer is made of two angles and a short cover plate, thereby necessitating a variety of notching down to give the ties an even surface. A section of two larger angles would obviate any notching, except the ordinary sizing of the tie.

Corporations very seldom take into consideration the cost of a floor and its future maintenance in canvassing proposals for bridges. Many of those now built have floors which it is almost impossible to renew, either in whole or in part, without disturbing the entire structure.

SUGGESTIONS FOR THE CARE AND MAINTENANCE OF IRON RAILROAD BRIDGES.

Track.—The track for a distance of 500 ft. on each side of the bridge must be kept in perfect line and surface. If on a curve, the proper super-elevation should be maintained and the rails carefully bent, not sprung, to the required radius.

When a bridge is at the foot of a grade, an elastic timber floor, upon which the rails are to be placed, must be carried back from the abutments at least 50 ft. This is especially necessary when the filling behind the abutments is of material easily affected by the frost.

Ties.—Ties must be of sawed timber, evenly spaced and carefully sized to a uniform depth at the stringers, upon which they should have a full and even bearing. Whenever a tie becomes soft and is cut into by the stringer, or by the rail, a hard-wood shim must be used until the tie can be replaced. The rails must be well spiked and drawn down to every tie; and at the lowest temperature the opening at the rail joints must not exceed $\frac{1}{8}$ of an inch.

Guard Timbers.—Guard timbers, notched and screw-bolted to the ties, must be placed upon every bridge; they must be drawn down tight to the ties and kept so. Whenever the guard timbers extend beyond the bridge, they must not be rigidly connected with the guard timbers upon the bridge. All old spike and bolt holes in ties or guard timbers must be plugged.

Wall Plates.—Where timber wall plates are used, care must be taken to give them a full bearing upon the masonry.

Masonry.—The piers and abutments must be kept clean and free from cinders and refuse material. All joints should be well pointed up, and frequent examinations made to detect fractures, or any signs of unequal settlement or movement of any kind. Whenever the masonry appears in the least degree insecure, a detailed statement of the facts should be sent at once to the Chief Engineer.

Iron Work on Bridge Proper.—Frequent and careful inspection must be made of all the iron work of the bridge, and especial care given to the friction rollers, pedestals and cast-iron work as being the parts most liable to give trouble. The rollers must be kept clean, so that they can move readily, and also be placed and kept at right angles to the line of bridge. If they cannot be cleaned from the outside, the trusses must be raised, the roller frames taken out, cleaned and replaced. Pedestals must be examined frequently to see if they are cracked or otherwise insecure. The nuts on the anchor bolts must be set up tight, and the drain-holes, if any, free and clear.

Cast iron in any form is objectionable in a bridge, and particularly so when in the shape of chord joint boxes. These require constant watching, particularly in cold weather; and should any cracks or imperfections be discovered, a report of the defect, as much in detail as possible, should be at once submitted to the Chief Engineer.

The rivets in the bridges should be examined from time to time, and loose ones cut out and replaced as soon as possible. If the web sheet be torn and the hole becomes elliptical, it should be reamed out and a larger rivet inserted, that is, provided the elongation be not more than $\frac{1}{4}$ of an inch greater than the diameter of the old rivet. Should the plate be torn to a greater extent, or the rivets after replacing become repeatedly loose, a full and accurate description of the defective parts should be submitted promptly to the Chief Engineer.

When a bridge has been put in proper adjustment, the nuts and turn buckles on the hangers, counters, lateral and sway-rods must be clamped in place and not altered. In bridges of ordinary span all of the parts will expand and contract so nearly alike that loosening or tightening

the rods is unnecessary, and only productive of excessive strains in some of the members of the truss.

Examinations.—Thorough examinations of every bridge should be made as often as possible, certainly not less than once in every 30 days, and more frequently upon those bridges which have some special weak points. Everything pertaining to the bridge and its surroundings should be carefully inspected, and a report, giving the condition of the masonry, superstructure and track, with any recommendations thought necessary, should be forwarded to the Chief Engineer, and in no case must extensive repairs or any alterations be made in a bridge until the same shall have been approved by him.

Painting.—All of the iron work should be painted at least once in every three years, but should rust spots appear between the periods of painting, they must be scraped and repainted as soon as detected.

Whenever the entire structure is to be painted, all rust must be thoroughly scraped off or otherwise removed, and the new paint applied evenly and not daubed on.

The above suggestions are presented by the writer as the result of an extended experience on a long line of road (the New York, Lake Erie & Western), with the hope that engineers of other railroads will also submit their ideas, and that out of the resulting discussion a greater knowledge of this important subject may be generally disseminated among those having the care of such structures. Greater safety to the public will certainly be the result.

DISCUSSION BY THEODORE COOPER.

The rusting or corrosion of wrought iron at ordinary temperatures is a very important matter of consideration.

The example given by Mr. Macdonald of the corrosion of an iron rod set in sulphur is not an uncommon one; numerous instances, however, can be given where iron set in sulphur has not corroded. The explanation, to the writer's mind, is a simple one. There is no chemical action between pure sulphur and iron at ordinary temperatures, these two elements only uniting at high temperatures—above red heat. But ordinary commercial sulphur generally contains sulphuric and sulphurous acid, produced by the oxidation of the sulphur during its process of sublimation. These acids are the immediate corroding agents when the impure sulphur and iron are in contact.

Such sulphur should be thoroughly washed before being used.

In general, the rusting or corrosion of iron only takes place in the presence of an acid and moisture.

In dry air at common temperatures, or under pure water free from air and carbonic acid, iron does not oxidize. Neither does it oxidize in dry carbonic acid gas; nor to any great extent, if at all, in damp oxygen. But in the presence of moisture and many acids the corrosion takes place readily and continuously.

The most common agent toward corrosion is carbonic acid gas.

Prof. Calvert found that damp air with a slight addition of carbonic acid produced a rapid oxidation; the process being, first a production of protoxide of iron, changing to the carbonate and then passing to the hydrated oxide or ordinary rust. Though the carbonic acid was the active agent in bringing about the combination, the carbonate of iron remained in small quantity—an apparent process of transfer or disposing influence.

As our atmosphere contains carbonic acid gas and aqueous vapor, and as all natural waters contain air and generally carbonic acid in solution, the rusting of iron is universal. It varies, however, in the degree of rapidity according to the conditions of the special location; the dryness of the air in certain regions making the action an exceedingly slow one, while in others the excess of moisture and gaseous acids produce an exceedingly rapid corroding action. In tubular bridges, tunnels covered with iron girders, and the overhead parts of bridges, the iron work is especially subject to corrosion, due to the excessive amount of moisture (condensed steam), carbonic acid and frequently sulphurous acid discharged upon the exposed surfaces from the locomotives.

While the sulphurous acid, if present, is a very active agent in promoting corrosion, the greatest factor is undoubtedly the carbonic acid gas. An analysis of a sample of rust taken from the Conway Bridge gave:

Sesquioxide of iron.....	93.04 per cent.
Protoxide ".....	5.810 "
Carbonate ".....	0.900 "
Silica.....	0.196 "

Mr. Wm. Kent, found in rust taken from a Pennsylvania Railroad bridge, where it was exposed to the action of the escaping gases, carbonic acid in considerable quantities, but only traces of sulphuric and sulphurous acids.

Under fresh or under salt water the corrosion of iron is largely influenced by the presence and amount of air and carbonic acid gas.

The action generally appears to be greater where the iron is alternately wet and dry.

The caustic alkalis and alkaline earths prevent the oxidation of iron by neutralizing the acids. Iron, therefore, does not corrode in alkaline solutions or when imbedded in lime.

The testimony in regard to the action of a thin coating of lime whitewash upon iron is contradictory. The writer has seen many cases where whitewash has corroded iron rapidly; others testify to its thorough preservative qualities. The difference may consist in the addition of other ingredients to the solution; for example, it is often customary for whitewashers to add common salt to the lime solution to increase the hardness of the coating; again, others add glue or similar material to the lime to increase its adhesive qualities. The one containing the salt would undoubtedly corrode the iron, and the other with the glue would not do so. Whether a thin layer of lime only, after the lime had taken up its full equivalent of carbonic acid, would continue to act as a preservative is doubtful; for from its hygroscopic character it would readily convey moisture charged with the destructive acid in to the surfaces of the metal.

As to hydraulic cement, the evidence is not so positive. Mr. Thos. C. Clarke, M. Am. Soc. C. E., says, in his report upon the Niagara Bridge, that on uncovering the anchorage links he found the iron as perfect as when put there, without the slightest sign of rust, though the mortar was saturated with moisture and the whole foundation evidently surrounded by water-bearing strata of rock. Gen. M. C. Meigs says he found a wrought iron pipe laid in cement concrete honey-combed and leaky after twelve years' time, and he learns from plumbers that in their experience American cements corrode iron.

This different testimony in regard to the action of cements may possibly be explained by the different circumstances of each case—such as the relative compactness and depth of the cement in which the iron is imbedded.

There is a possibility, however, that in certain cements the silicates may be soluble in water, and thus furnish the acid agent toward corrosion. Mineral wool made from furnace slag very closely approximating the composition of hydraulic cements has been found in many cases to corrode iron very rapidly. It was claimed that this was entirely due to the hygroscopic character of this material, but recent in-

* In a verbal discussion of the paper on the care and maintenance of bridges.

stances reported to me would appear to lead to the belief that the wool in the presence of water not only corrodes the iron, but also disintegrates and hardens into a solid mass.

Wet coal ashes corrode iron very rapidly.

Mr. Wm. Metcalfe, M. Am. Soc. C. E., states that a wrought-iron pipe buried in coal ashes was completely eaten away in one year's time.

As a curious instance of the slight causes which promote oxidation, the experience of a manufacturer of fine cutlery was related to me. He found at one time a large portion of his goods being returned to him as in damaged condition; instead of the bright clean surfaces for which such articles are noted, he found rusty, deeply oxidized blades. After much anxiety and watching to determine the cause, whether it was damp paper, the ill-will of some of his agents, or other cause, it was located upon the man who sorted and wrapped the knives into packages. Everything he touched was found to rust, from the peculiar acid character of his skin exhalations.

Similarly, it is well known that some persons cannot carry pocket-knives or bright iron articles, as keys, etc., about their person without their becoming very rusty.

The rusting of iron proceeds with great rapidity after it has once commenced, because the rust of iron is a ready absorber of moisture and gases, and it thus constantly conveys new elements of destruction into the yet unchanged metal.

It is to this fact that the great difference in the rusting of used and unused rails, machinery and tools is due. The jars and vibrations to which the one is subjected keep the surfaces clear of accumulated rust, that would act as storage reservoirs for the corroding elements.

There is often much misconception in regard to the amount of iron contained in a certain thickness of rust. Dense compact rust may contain enough iron to equal one-fourth or one-fifth of its thickness, but the looser and more common kind of rust will not contain over $\frac{1}{4}$ of its thickness in pure iron. In other words, rust $\frac{1}{4}$ inch in thickness will contain from $\frac{1}{16}$ to $\frac{1}{32}$ inch of iron, according to the density of the rust.

The preservation of iron from corrosion is a subject of

inspection, that it is very important, both from points of economy and of safety, that the supervision of these points should be given to competent men.

The original design affects the maintenance and care of our bridges, not only by the form and proportions of the structure and its details as to strength, but also as it affects the accessibility for cleaning and painting, the freedom from lodgment of water and dirt, the amount of surface exposed to corrosion, the number of parts subject to adjustment and the facility of repair and renewal of the ties or wooden floor.

The writer has seen bridges recently constructed, and which have been accepted by engineers of an important railroad that have their wooden floors built into the iron work in such a manner that a broken or decayed tie cannot be replaced except by removing the whole bridge floor.

The inspection of bridges should be something more than the superficial examination of the track-walker. To know that every member is doing its duty properly, and to discover the reason when such is not the case, and the remedy to be applied, requires the supervision of a more intelligent class of men than usually are delegated to this work.

Of hundreds of bridges examined during past years by the writer, it would be safe to say that not more than ten per cent. of them were found in a condition to do their best duty; many were badly neglected, and some positively dangerous; all showing a positive want of intelligent inspection and supervision. It would undoubtedly be true economy, and certainly a just duty to the public, for every railroad to have its bridges carefully and intelligently examined at least once a year by a special expert. If it accomplished no other end than to check and educate the ordinary local inspectors in a proper execution of their duties, it would pay for the expense.

Wellman's Patented Car-Wheel.

The engravings represent different forms of a car-wheel which has recently been patented by Mr. Samuel T. Wellman, of Cleveland, Ohio. It is intended to make the wheel

space of the coach clear; cover the floor with inexpensive rugs where tired babies may roll and stretch their limbs as on their home carpets." Patent not yet applied for.

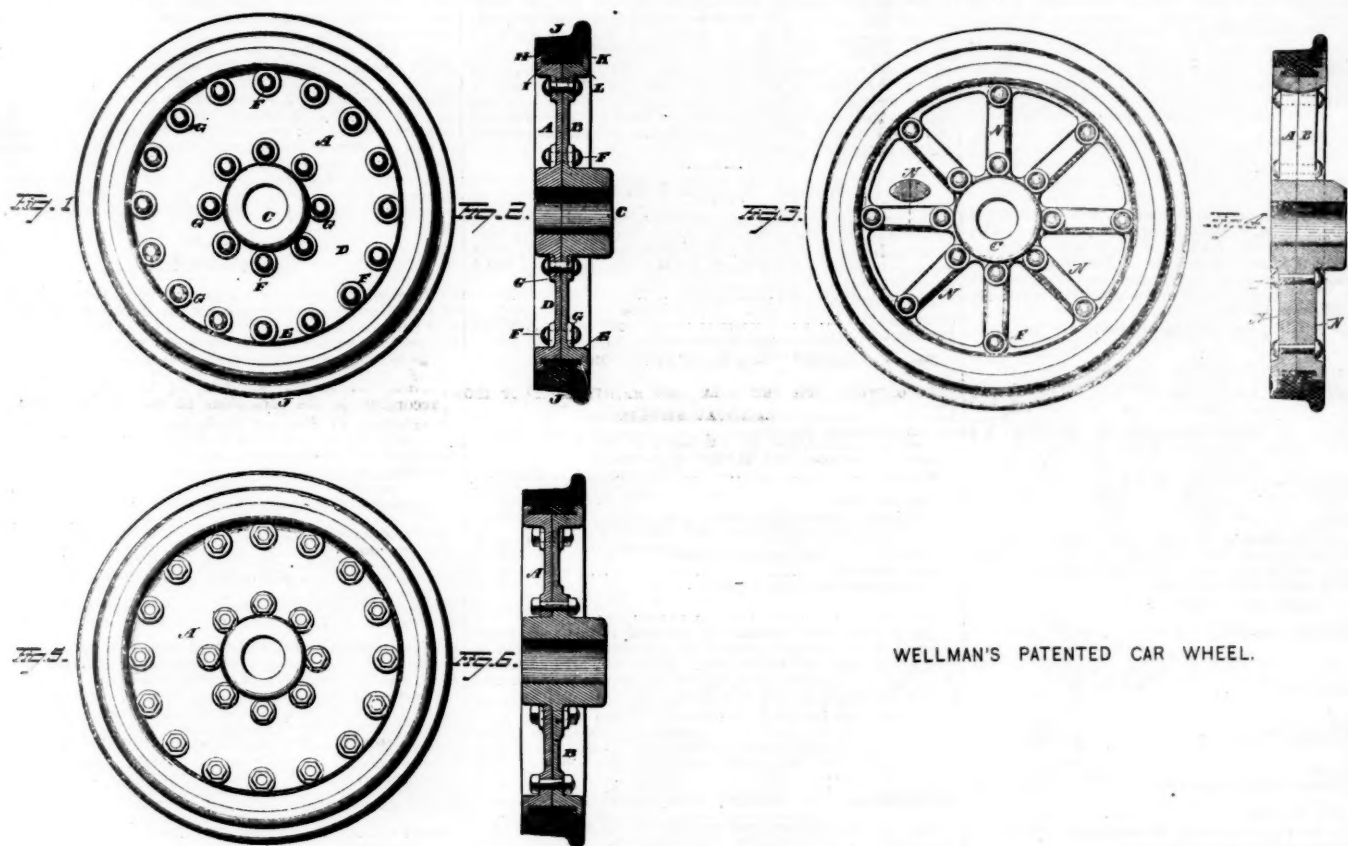
ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the present volume of the *Railroad Gazette*:

Page.	Page.
Atchison, Topeka & Santa Fe.....	71
Boston, Barre & Gardner.....	167
Boston & Lowell.....	23
Boston, Revere Beach & Lynn.....	100
Central Pacific.....	163
Charlotte, Col. & Augusta.....	21
Chesapeake & Ohio.....	138
Chicago, Bur. & Quincy.....	11
Chicago & Alton.....	12
Chi., Milwaukee & St. Paul.....	73
Cincinnati, N. O. & Texas Pac.....	39
Cleveland & Pittsburgh.....	30
Columbi. & Greenville.....	59
Connecticut River.....	15
Delaware & Hudson Canal.....	100
Delaware, Lacka. & Western.....	122
European & North American.....	22
Fitchburg.....	40
Grand Trunk.....	50
Hannibal & St. Joseph.....	163
Hartford & Conn. Western.....	7
Houston & Texas Central.....	30
Huntingdon & Broad Top.....	121
Illinois Central.....	167
Lehigh Coal & Navigation Co.....	134
Lehigh Valley.....	23
Long Island.....	73
Maine Central.....	21
Missouri Pacific.....	167
New Haven & Northampton.....	7
New London Northern.....	138
N. Y. Cen. & Hudson River.....	7
N. Y., New Haven & Hartford.....	22
Northern Central.....	123
Ohio & Mississippi.....	105
Pennsylvania & N. Y.....	75
Pennsylvania Railroad.....	150
Philadelphia & Reading.....	22
Phila. W. & Baltimore.....	139
Pittsburgh & Lake Erie.....	40
Portland & Ogdensburg.....	100
Portland & Rochester.....	100
Providence & Worcester.....	174
Rochester & Pittsburgh.....	41
St. Louis, Iron Mt. & Southern.....	167
St. Paul & Duluth.....	104
South Carolina.....	80
Texas Pacific.....	164
Virginia Midland.....	100
Wabash, St. Louis & Pacific.....	167
Western R. R. Association.....	37
Woodstock.....	100
Worcester & Nashua.....	40

Camden & Atlantic.

This company owns a line from Camden, N. J., to Atlantic City, 59.79 miles, with a branch to South Atlantic, 5.71 miles. It leases the Philadelphia, Marlton & Medford road, from Haddonfield to Medford, 11.70 miles, and the May's Landing road, from Egg Harbor to May's Landing, 7 miles,



WELLMAN'S PATENTED CAR WHEEL.

vast importance, and has given rise to many expedients more or less effective, such as alloying iron with other metals, as chromium, tin, copper, arsenic, etc., to obtain a less corrodible metal; plating the surfaces with other less oxidizable metals, as nickel, tin, copper, silver or gold; coating with zinc, a metal that is readily oxidized upon the surface, but whose oxide, when formed, becomes a protection to any further oxidation (when not subject to other acids than carbonic-acid gas); coating with fused mineral enamels; covering with lacquers; coating with magnetic oxide of iron by the processes of Barff or Bower, by subjecting to high temperatures and the presence of moisture; and lastly, the use of paints of innumerable characters.

For general engineering structures, the coating given to iron surfaces for their protection against corrosion must be not only moderate in cost, but of such a character as to be readily renewed when removed by accident or design. It must also differ from zinc in being able to resist the corroding action of sulphurous-acid gas and the chlorides, in locations where these may occur.

This practically reduces us to the use of paints (using this term to include not only the paints proper, but varnishes, oils and other materials applied in a liquid form). The relative merits of the paints depend upon their durability, adhesiveness and imperviousness. The cracking of the paint and want of adhesion produced by too rapid drying of the paint, and the want of adhesion due to the presence of rust upon the surfaces of the iron are the most frequent causes of failure in the better classes of paints. All rust should be carefully removed from the surfaces of the iron before painting; a coat of raw linseed oil then makes an excellent covering for the surface, elastic, perfectly adherent, and a good durable substratum for future coverings. In order to get our iron work out of the shops quickly and in a condition to be handled, we resort too often to quick-drying paints, to the future injury of the work.

As to the pigment to be used for the covering of this substratum, red lead, oxide of iron, etc., each have their own advocates.

The maintenance of iron bridges is so dependent upon the detail of their design, and the method and character of the

centre of two or more sections of soft steel bolted or riveted together. The peripheries of these sections form retaining rings to hold the tire in case it should break.

The inventor describes the construction as follows in the specification of his patent:

In constructing one of my improved car-wheels the soft cast-steel plates are first temporarily secured together for the purpose of boring the rivet-holes, and also of effecting such turning as may be necessary to finish the plates. The tread of hard cast-steel, which has been previously turned to the required shape (allowance being made for shrinkage) is now heated, and the plates A and B placed on opposite sides of it in such manner as to engage their flanges with its annular grooves. When this adjustment is obtained the plates are permanently secured together by rivets, as shown. After the wheel is formed in this manner the outer periphery of the tread is turned and finished; but this may be done before it is secured to the plates, if desired. During the operation of finally securing the plates together and locking the tread to them hydraulic or other pressure may be employed as an auxiliary to the process.

The modified form of wheel shown in figs. 3 and 4 of the drawings is substantially the same as the wheel shown in figs. 1 and 2 of the drawings, the only difference being that instead of having an imperforate body, the same is formed of spokes N, which are riveted together, and which are cast integral with the inner and outer plates of the wheel.

In the modified form of wheel shown in figs. 5 and 6 of the drawings the hub is formed with the outer plate alone, the inner plate being provided with a central aperture to fit over the inner portion of the hub. In this wheel also the plates are secured together by bolts, which may, if desired, be applied to the wheels shown in the first figures of the drawings.

New Ideas.

The latest idea in car construction is suggested in a woman's letter to an Indianapolis paper. It is "to fit up a car with different heights of seats, having say one-half the

making a total of 84.20 miles worked. The statements for the year ending Dec. 31 were presented at the recent annual meeting.

The stock and bonds are as follows:

Common stock.....	\$377,400
Preferred stock.....	880,650
Bonded debt.....	1,319,400

Total.....\$2,577,450

The bonded debt consists of \$490,000 first-mortgage 7 per cent. bonds, \$497,000 second-mortgage 6 per cent. bonds, \$225,000 consolidated 6 per cent. bonds, and \$107,400 real estate bonds and mortgages.

The earnings and expenses for the year were as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Earnings.....	\$550,406	\$512,840	I. \$37,566	7.3
Expenses.....	360,084	373,864	D. 23,780	3.7
Net earnings.....	\$190,322	\$138,976	I. \$51,346	36.9
Gross earn. per mile.....	6.513	7.356	D. 843	11.4
Net ".....	2.260	1.994	I. 266	13.4
Per cent. of expenses.....	65.42	72.88	D. 7.46	

The gross earnings were larger than in any year since the formation of the company, except in 1876, when competition was not so sharp as it was last year. The Medford road was only worked about three months in 1881.

The income account was as follows:

Net earnings.....	\$190,321.84
Interest, state tax, etc.....	\$100,724.70
Interest on Kensington & N. J. Ferry stock.....	4,406.75
Dividend on preferred stock.....	34,872.00
	140,003.54

Balance, surplus for the year.....	\$50,318.50
Increase of floating debt and decrease of assets.....	56,039.09
Total balance.....	\$106,357.59

This balance was expended in improvements of road, additional equipment and other additions to property.

The Pennsylvania Railroad Co. has recently acquired a controlling interest in the stock, and the road will hereafter be worked in close alliance with the West Jersey, although the separate organization will be maintained.

The result of the year was as follows:

Earnings of main lines.....	\$5,661,316.63
Net earnings over Chi., Bur. & Quincy.....	448,461.74
Earnings over other lines.....	113,802.54
Calro transfer.....	144,347.82
Springfield Division.....	330,471.35
Middle Division.....	261,380.55
Total earnings in Illinois.....	\$6,959,780.43
Leased lines in Iowa:	
Dubuque & Sioux City.....	\$1,093,806.20
Iowa Falls & Sioux City.....	708,914.39
Cedar Falls & Minn-sota.....	142,751.16
Total earnings.....	\$8,905,312.18
Working expenses.....	\$3,998,565.75
Charter tax paid state of Illinois.....	396,036.11
Taxes, Springfield and Middle Divs.....	22,115.94
Taxes, leased lines in Iowa.....	66,598.27
Rentals, leased lines in Iowa.....	761,226.96
Net balance.....	\$3,680,769.15
Net receipts of land office.....	127,508.55
Interest on Chi., St. L. & N. O. bonds.....	181,825.00
Exchange, etc.....	18,223.76
Total.....	\$3,988,326.40
Interest on bonds.....	\$531,700.00
Dividends, 7 per cent.....	2,039,000.00
Construction account in Illinois.....	1,271,451.63
Balance, surplus income for 1882.....	\$155,871.83

Additions and renewals include the laying of 8,717 tons of steel rails and 401,710 new ties; 5.03 miles of new fence in Illinois, and 42.09 miles in Iowa. There were 16.21 miles new sidings laid, and 79.69 miles of track ballasted with stone, gravel or cinders. There were 2,782 feet of bridges rebuilt, two new spans of iron bridge erected and a new draw-bridge over the Chicago River begun.

There were 9 locomotives built to replace old ones broken up. The cars were generally repaired and put in good order. Charges to equipment account were \$109,739 for 22 passenger cars; to construction, \$1,141,450.16 in Illinois, and \$109,567.05 in Iowa, this charge including excess of cost of steel rails over iron.

General Superintendent Jeffery's report says: "A coal branch 10 miles long, from Buckingham on the Middle Division north to the coal mines in Essex township, was completed in the latter part of the year, making the total length of road operated in Illinois 928.19 miles, and 402.16 miles in Iowa. There are in addition 219.83 miles of side-tracks; 41 miles of second, third and fourth tracks; an aggregate of 1,591.18 miles of tracks, of which 854.90 miles are in steel.

"The necessity for extending the second main track south from Kensington has long been felt. This work was entered upon last year and completed to Homewood, 9 miles. Between there and Monee, 10.5 miles, the second track is nearly finished. Two main tracks, for the use of freight trains exclusively, between Chicago and Grand Crossing, 9.5 miles, were begun, and the greater part of the work was completed at the close of the year. The two passenger tracks were extended from Oakwood to Grand Crossing, 1.17 miles, and one-half the grading is done for their extension to Kensington.

"The extension of the Kankakee & Southwestern Railroad—Middle Division—from Colfax to Bloomington, 20 miles, was nearly completed; the grading and bridging are practically finished and 11 miles of the track laid.

"A double-track branch, 5 miles long, from Parkside to South Chicago, is well under way, and will be ready for use this spring."

Cleveland, Columbus, Cincinnati & Indianapolis.

This company owns lines from Cleveland, O., to Columbus, 138 miles; Delaware, O., to Springfield, 50 miles; Gallion, O., to Indianapolis, Ind., 203 miles; a total of 391 miles owned. It leases the Cincinnati & Springfield road, from Springfield to Cincinnati, 80½ miles, and the Mt. Gilead Short Line, from Leveing, O., to Mt. Gilead, 2 miles, making 478½ miles worked. The earnings given below are for the 291 miles owned. The report is for the year ending Dec. 31.

The equipment consists of 154 locomotives; 75 passenger, 6 sleeping, 8 mail and 19 baggage and express cars; 2,719 box, 599 stock, 629 flat, 1,379 coal and 61 caboose cars; 1 directors' car, 1 pay car and 12 wrecking and other service cars.

The general account is as follows:

Capital stock.....	\$15,000,000.00
Less held by company.....	8,400.00
Stock outstanding.....	\$14,991,600.00
Bonds.....	6,365,000.00
Bills, accounts and balances payable.....	1,024,039.53
Balance to credit of income.....	2,851,084.43
Total.....	\$25,232,623.66
Road and property.....	\$18,808,793.62
Materials and fuel.....	183,058.12
Stocks, bonds, real estate, etc.....	1,673,973.30
Cincinnati & Springfield advances.....	2,159,931.21
Indianapolis & St. Louis advances.....	723,140.64
Bills and accounts receivable.....	1,476,028.63
Cash.....	206,898.24
Total.....	\$25,232,623.66

Stock is unchanged, except that the company owns one share more than last year. The bonded debt was reduced \$48,000 by bonds redeemed for sinking funds; it consists of \$50,000 Cleveland, Columbus & Cincinnati bonds; \$367,000 Bellefontaine & Indiana bonds; \$3,000,000 first-mortgage sinking fund bonds, and \$2,948,000 first-consolidated bonds.

The traffic for the year was as follows:

Train-miles.....	1882.....	1881.....	Inc. or Dec. P. c.
Passenger.....	1,045,899	1,000,036	I. 34.963 3.5
Freight.....	2,185,172	2,512,385	D. 327,213 13.0
Service and switching.....	1,173,890	1,170,976	I. 1,914 0.2
Total.....	4,393,961	4,683,397	D. 290,336 6.2
Passengers carried.....	1,035,794	890,330	I. 133,434 15.2
Passenger-miles.....	44,759,982	41,889,170	I. 3,070,803 7.4
Tons freight carried.....	2,755,867	2,880,923	D. 125,056 4.3
Ton miles.....	447,411,484	480,723,710	D. 33,312,226 6.9
Average train-load:			
Passengers, No.....	43	42	I. 1 2.4
Freight, tons.....	205	191	I. 14 7.3
Average receipts:			
Per pass.-mile.....	2.23 cts.	2.159 cts.	I. 0.076 ct. 3.5
" net.....	0.744 "	0.937 "	D. 0.193 " 26.6
Per ton-mile.....	0.706 "	0.671 "	I. 0.035 " 5.2
" net.....	0.193 "	0.160 "	I. 0.033 " 20.6

Locomotive service cost 17.43 cents last year, against 17.46 cents per mile run in 1881. There was an increase in cost of repairs, but a decrease in cost of fuel, stores and wages.

The division of freight traffic and the rates thereon, in cents, were as follows:

	Through.....	Local.....
East-bound.....	240,253,318	46,557,878
West-bound.....	119,268,911	41,331,377
Total.....	359,522,230	87,889,255

Of the total freight traffic 61.1 per cent. was east bound, and 35.9 per cent. west bound.

The average receipt and cost per ton-mile, in cents, have been as follows for ten years past:

1882.....	Rec't. Cost. Net.....	1877.....	Rec't. Cost. Net.....
1881.....	0.706 0.573 0.193	1876.....	0.800 0.849 0.041
1880.....	0.671 0.511 0.190	1875.....	0.814 0.758 0.058
1879.....	0.702 0.590 0.202	1874.....	1.005 0.887 0.118
1878.....	0.697 0.575 0.122	1873.....	1.192 1.051 0.141
	0.752 0.655 0.097		1.362 1.199 0.263

The average receipt last year was 51.8 per cent. of that of 1873, while the cost was 46.7 per cent., and the average net receipt 73.4 per cent.

The earnings for the year were as follows:

1882.....	1881.....	Inc. or Dec. P. c.
Freight.....	\$3,156,417	\$3,225,356 D. \$65,939 2.0
Passengers.....	1,006,270	899,918 I. 106,352 11.2
Mail and express.....	178,789	165,077 I. 13,712 8.3
Rents, etc.....	103,125	86,271 I. 16,854 19.6
Total.....	\$4,441,091	\$4,366,622 I. \$74,469 1.7
Expenses.....	3,085,055	3,070,858 I. 15,197 0.5
Net earnings.....	\$1,356,036	\$1,295,764 I. \$60,272 4.6
Gross earn. per mile.....	11.360	11.169 I. 191 1.5
Net ".....	3.469	3.317 I. 152 4.6
Per cent. of exps.....	69.49	70.37 D. 0.92

Taxes, which are included in expenses above, were \$121,273 in 1882, and \$112,689 in 1881. The working expenses, deducting taxes, were 66.73 per cent. of gross earnings last year.

The year's earnings of the various fast freight lines over the road were as follows:

Pennsylvania R. R., Empire Line.....	\$127,848
N. Y., Lake Erie & Western, South Shore Line.....	\$11
Great Western Dispatch.....	325
N. Y. Central & Hudson River, White Line.....	\$697,996
Merchants' Dispatch.....	280,116
Rhinebeck Line.....	315
Hoosac Tunnel Line.....	66,937
Total.....	\$1,151,548

As compared with 1881, there was a decrease in these earnings of \$207,431, or 15.3 per cent.

Advances were made to the Cincinnati & Springfield during the year, amounting to \$279,020.06 to meet the deficit in operating; \$138,839.30 for purchase of lands in Cincinnati and elsewhere; \$20,369.54 for construction of Middle-town Branch; a total of \$438,228.90 advanced.

The Mt. Gilead Short Line earnings were \$4,863.42; expenses, \$4,848.19; net earnings, \$15.23, a small decrease as compared with the previous year.

Track renewals for the year included 1,628 tons of steel rails and 201,676 new ties. There were 7.66 miles of new sidings built and 18.69 miles of track were ballasted. There are now only 11.68 miles of the main track laid with iron rails. Nine new iron bridges were built, two new trestles completed and extensive general repairs made to bridges. Several highway crossing gates were put up, the station buildings repaired and a new ore dock built at Cleveland.

One switching and 10 mogul freight engines were built and 7 old engines broken up. Ten new passenger cars were bought, one mail, two baggage and two chair cars built. A number of freight cars were rebuilt and 200 coal cars bought. More mogul engines are to be purchased, to replace the lighter freight engines now in use.

The income account and the Treasurer's statement are as follows:

Net earnings for the year.....	\$1,356,036.16
Premiums, interest, land sold, etc.....	94,305.28
Total.....	\$1,450,341.44
Interest paid.....	\$504,913.75
Judgment paid, income tax suit.....	6,015.52
Balance.....	510,929.27
Treasurer's cash, Dec. 31, 1881.....	\$639,922.17
Cin. Ham. & Dayton stock sold.....	189,394.16
Dayton & Union bonds sold.....	37,500.00
Bills payable increased.....	150,000.00
Sundry accounts.....	7,563.84
Total.....	\$1,995,616.26
Bonds redeemed.....	\$43,000.00
Additions to property.....	315,701.07
Advances to Cin. & Springfield.....	438,228.90
" Ind. & St. Louis.....	723,310.64
Bills receivable and sundry accounts.....	288,446.51
Total.....	1,788,718.02

Treasurer's cash, Dec. 31, 1882..... \$206,898.24

A dividend of 2 per cent. from the surplus earnings of the year was declared and paid on Feb. 1, 1883.

President Devereux's report says: "During the first six months of this year there was no improvement in the through rate of freight traffic, which was in a state of almost hopeless depression, and continuing at the lowest point that had ever been reached in the conduct of railroad transportation. But in June, through the earnest co-operation of all roads, an agreement was established, restoring a very moderate tariff, upon which for the last half of the year freight rates were well maintained. The restored rates were nevertheless very low, and the basis of the winter tariff only reached the figure of 30 cents per 100 pounds Chicago to New York.

"The average gross freight rate per ton-mile for the year is 0.706 cents against 0.671 cents in 1881, an increase of 0.035 cents, or 5.22 per cent. The cost freight rate per ton-mile for the year is 0.513 cents, against 0.511 cents in 1881, an increase of 0.002 cents, or 0.39 per cent.

"The gross freight rate of the year, only about seven mills per ton-mile is unreasonably low, and the cost freight rate per ton-mile will compare favorably with that of other roads. "There has been in many quarters an increase in freight, coming to and passing over the road, but on the north and south of the main line, between Indianapolis and Cleveland, a loss of tonnage has been perceptibly felt through the operations of new and rival roads. The competition of such lines, which develop or originate a limited traffic, but draw or divert largely from the older and established roads, has to be endured. On the Cincinnati & Springfield Division the withdrawal of the New York, Pennsylvania & Ohio Company's traffic occurred on the first of the year. "

"With the dissolution of the Ohio Railway Co. your directors sold the 9,199 shares of the stock of the Cincinnati, Hamilton & Dayton Railroad Co., which had been purchased for reasons appearing in the annual report of 1880. No benefit could accrue to this company from further holding of the said shares.

"During the year, and in pursuance of the general authority conferred by the stockholders and directors, the interest of the Pennsylvania Co. in the Indianapolis & St. Louis Railroad and its leased line, the St. Louis, Alton & Terre Haute Railroad, has been acquired by this company upon terms satisfactory to your Board. And, on Feb. 24, 1883, the old lease to the Indianapolis & St. Louis Railroad was substan-

tially superseded by a new and modified lease agreed upon between the St. Louis, Alton & Terre Haute Railroad Co. and the Indianapolis & St. Louis Railroad Co. as reorganized. This lease will, as soon as the proper legal notice can be given, be submitted to you for your approval.

"The principal changes are that your company becomes a joint lessee with the Indianapolis & St. Louis Railroad Co., and jointly liable for the rent to be paid. Under the former lease the rent was 30 per cent. upon the gross earnings up to \$2,000,000; and 25 per cent. of any excess over said amount until the year's earnings reached \$3,000,000; 20 per cent. of any excess over \$3,000,000 was to be paid, and it was guaranteed that in any event the agreed percentage should amount each year to at least \$450,000.

"Under the new lease the rent guaranteed is \$450,000, and that amount is all that is to be paid unless the gross earnings exceed \$1,750,000, and then but 20 per cent. is to be paid of the excess of gross earnings over \$1,750,000.

"The modification is thought to be very important, and with the entire line from Cleveland to St. Louis now in your sole control, it is believed that your property will be greatly benefited, and that the Indianapolis & St. Louis Railway, with its leased line, heretofore a great burden upon you, will become self-sustaining. "

"The railway with its equipment has been maintained to standard in every part. Attention is particularly directed to the accompanying reports and exhibits as containing the fullest information of the year's results, and explaining the affairs of the company. And recognition is rendered of the faithful and efficient service in the performance of duty by officers and employees generally.

"The work of the year has been attended with unusual complications. The outcome, it may be said, is not unsatisfactory, and the future of the property seems more secure and promising than at any period since 1867."

Manhattan.

A report submitted by the New York State Engineer to the Senate, in response to a resolution of that body, contains the first authentic statement of the operations of the Elevated lines in New York for the year ending Sept. 30, 1882. The report is voluminous and goes at great length into the question as to what was the capital actually expended on these roads. There is room only for the conclusions reached by the State Engineer, which are as follows:

"First—That no fraud has been either exercised or attempted on the part of these corporations as against the state at large, the public or individuals, with reference to the amount of capital actually expended, the actual cost of construction and equipment, or the rates charged for transportation.

"Second—That the amount of securities issued by the respective corporations, as represented by their outstanding stock and bonds, was no greater than was actually required in order to provide the means necessary to secure the proper construction and equipment of their railways, and that the whole amount of these securities has either been absorbed or utilized in good faith for that purpose.

"Third—That it is the common practice of railway corporations both in this state and the United States to charge the losses or discount on their securities to the cost of construction, equipment and other necessary expenditures, and there appears to be no valid reason why these elevated railway corporations should be inhibited from pursuing the same course.

"Fourth—That the roads were at first regarded as wild and visionary undertakings, and it required years of the closest study accompanied by costly experiments before their completion became sufficiently developed to induce capitalists to invest in their securities upon any terms—and even at the present time their final and permanent success must be regarded as exceedingly problematical.

"Fifth—That with regard to the Manhattan Co., which is now the lessee and operator of the railways of the two other companies, he is unable to see that its stock should be regarded in any degree as a factor in the capital actually expended by the lessor companies in the construction and equipment of their lines."

The other statements of the report are given below:

NEW YORK ELEVATED.	
The "capital actually expended" as stated by the State Engineer, is as follows:	
Stock.....	\$6,500,000
First-mortgage 7 per cent. bonds.....	8,500,000
Cash items.....	391,921
Total.....	\$15,391,921

The earnings and expenses for the year were as follows:

Gross earnings.....	\$3,216,369
Working expenses.....	\$1,844,600
Taxes.....	208,463
Net earnings.....	\$1,163,216

These net earnings were equivalent to 7.55 per cent. on the "capital actually expended." If the interest on the bonds be deducted, the remainder is equal to 8.74 per cent. on the stock.

METROPOLITAN.

The "capital actually expended" is stated as follows:	
Stock.....	\$6,500,000
First-mortgage 6 per cent. bonds.....	10,818,000
Second-mortgage 6 per cent. bonds.....	2,000,000
Cash items.....	172,869
Total.....	\$19,490,869

The earnings and expenses for the year were as follows:

Gross earnings.....	\$2,757,264
Working exp. uses.....	\$1,873,680
Taxes.....	202,088
Net earnings.....	\$771,496

These net earnings were equivalent to 3.75 per cent. on the "capital actually expended." If the interest on bonds be deducted, there is a deficit of \$37,554.

RECAPITULATION.

The recapitulation or total result of the operation of the two roads, with the taxes of the Manhattan Co. included, is as follows for the year:

Gross earnings, all lines.....	\$5,973,633
Working expenses, all lines.....	\$3,988,370
Taxes, all lines.....	410,551
Taxes, Manhattan Co.....	109,093
Net earnings.....	\$1,785,619

These net earnings were equivalent to 5.12 per cent. on what the report calls "capital actually expended"—that is, on the \$13,000,000 stock, \$21,318,000 bonds and \$564,790 cash items of the two companies. Deducting interest on bonds leaves a balance equal to 3.81 per cent. on the stocks.

If the \$13,000,000 Manhattan stock be added, the net earnings were 3.73 per cent. on the entire nominal capital, or to interest on the bonds and 1.90 per cent. on the entire stock.



Published Every Friday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particularly as to the business of railroads, and suggestions as to its improvement. Discussions of subject pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

THE ILLINOIS CENTRAL REPORT.

The Illinois Central Railroad, which for some years after 1874, when most other Western railroads had considerable increase in traffic (though not always in earnings) suffered a great decrease in traffic as well as earnings, in its freight traffic since 1877 and in its passenger traffic since 1879 has shown a growth so great and rapid as to prove that it has outgrown the disability that so suddenly and sharply checked its progress after 1874.

The report for 1882 shows that its system of roads in Illinois and Iowa earned gross in 1882 34 per cent. more than in 1881, when they were larger than in any previous year since 1869. Gross and net earnings and working expenses of the whole system worked since 1867 have been, with gross earnings of the Iowa lines separately, as follows:

	Gross earnings.	Expenses and taxes.	Net earnings.	Iowa lines. Gross earnings.
1868	\$7,817,629	\$5,032,279	\$2,785,350	\$1,019,698
1869	8,823,482	5,403,952	3,419,530	1,442,484
1870	8,678,958	5,246,120	3,432,838	1,467,405
1871	8,401,142	5,124,906	3,276,236	1,348,691
1872	8,026,754	5,300,345	2,726,409	1,413,321
1873	8,268,325	5,084,682	3,183,643	1,677,301
1874	7,900,721	4,492,780	3,407,941	1,627,898
1875	7,802,556	4,428,547	3,374,009	1,850,127
1876	7,040,969	4,270,206	2,770,763	1,619,277
1877	6,639,845	3,505,372	3,134,473	1,513,139
1878	7,111,184	3,479,625	3,631,559	1,538,558
1879	7,234,464	3,421,710	3,812,754	1,523,182
1880	8,304,811	4,117,097	4,187,714	1,775,487
1881	8,586,397	4,623,518	3,962,879	1,852,443
1882	8,905,312	4,483,316	4,421,996	1,945,532

In all the years of great activity in business previous to 1873 this company made no progress in earnings. The vast territory in Illinois, which it had had pretty much to itself, was being gridironed with railroads, and they diverted traffic about as fast as it grew, and their competition brought down the rates, in addition; and after 1873 there was a decrease in traffic joined with a reduction in rates which at last made the gross earnings in 1877 about one-fourth less than in 1869.

It is true that there was very soon such a tremendous decrease in the working expenses that the decline in net earnings was by no means so serious. Indeed, the greatest reduction in profits was during the era of high prices before 1874, when though earnings fell off expenses could not be decreased.

The length of road worked, it should be borne in mind, reached 1,008 miles in 1870, and did not change until 1878, when it became 1,256, and has since increased to 1,330—of which 402 miles has been in Iowa since 1870.

When these Iowa lines were leased it seemed altogether probable that before this time they would earn per mile nearly or quite as much as the Illinois lines were then earning. The Illinois lines then earned \$10,219 per mile. In 1870 the Iowa lines earned \$3,781 per mile, and in 1882 \$4,831. These earnings obstinately refused to grow until quite recently. But

since 1879 their rate of growth (as was to be expected) has been much faster than that of the Illinois lines, though the latter have had some increase in mileage. The increase in gross earnings since 1879 has been 27 per cent. on the Iowa and 14½ per cent. on the Illinois lines.

The earnings of the Iowa leased lines for the four years from 1869 to 1872, inclusive, averaged \$1,418,000 a year; they were not completed until 1870. The average earnings per year, for the four years from 1873 to 1876, inclusive, were \$1,693,900; then for three years from 1877 to 1879 they were \$1,525,000; and for the last three years have been \$1,858,000. There is hardly another such example to be found of a long line opened through a fertile prairie country, mostly unoccupied, which made so very little progress in earnings as did these 402 miles in northern Iowa in the twelve years from the opening of the road until 1880. It has always been certain that this line would have a heavy agricultural traffic, but the time when the traffic would come depended chiefly on the settlement of the country west of Fort Dodge, and this has been remarkably slow in coming. But it seems to be coming now, and the increase in the earnings last year is the more significant because the crops of 1881 were not good. It is the increase in the area cultivated and the immigration which has given the additional traffic, and it has been made in spite of a large increase of competing railroads in Northwestern Iowa, which have reduced the territory which makes use of the Illinois Central, the Milwaukee & St. Paul, the Chicago & Northwestern and the Burlington, Cedar Rapids & Northern, all having built lines in the territory which until lately was served almost exclusively by the Illinois Central. The great development of the railroads in Dakota, west and northwest of Sioux City, is not likely to be of great advantage to the Illinois Central, however, except as it builds up the trade of Sioux City, because all these Dakota lines are owned or controlled by companies which have lines of their own to the East, which naturally will take the through traffic. The Illinois Central not owning the line across Iowa, but paying a high rental for it, which increases with its earnings, has not had the same motive for extending west of Sioux City and making branches in Iowa as if it had owned the road. The larger part of the profits on the traffic which such lines would bring the Dubuque & Sioux City line would go to the lessors. The rental and taxes were 42½ per cent. of the gross earnings of these lines in 1882. The expenses are not given, but there was probably some profit on the lease that year. Only of late years has there been, however, and the lessee has advanced nearly \$1,200,000 for their improvement.

We have said that the traffic fell off after 1874, and that of late years it has grown rapidly again. Its course may be traced exactly by the following table, showing the amount each year since 1865:

Year.	Pass. miles.	Millions of—	Year.	Pass. miles.	Millions of—
1865	56.8	135.2	1875	50.8	284.6
1866	42.5	171.2	1876	51.2	264.6
1867	47.6	225.8	1877	46.1	249.3
1868	43.3	253.3	1878	43.8	306.3
1869	54.3	285.4	1879	44.6	335.5
1870	50.6	302.2	1880	63.3	381.3
1871	51.8	272.3	1881	82.1	386.0
1872	48.5	275.3	1882	85.3	417.8
1873	51.1	273.6			

This road had an enormous traffic during the war in the carrying of soldiers, and the heavy passenger traffic of 1866 was a relic of it, and of the necessary Southern movement directly after the war. The next year it was probably more nearly a normal year for that time. From 1867 to 1870 there was an increase of 28 per cent. in passenger traffic, and of 96 per cent. in freight traffic. The whole of the Iowa lines had been acquired meanwhile. The passenger traffic was never again so large as in 1870 until 1880—in 1877 it was 15 per cent., and in 1878 19 per cent. less. The increase in this traffic since 1879 has been marvelous—no less than 91 per cent. Doubtless a very large part of the increase has been in the suburban traffic out of Chicago, which, as we have shown elsewhere, last year formed one-fourth of the total passenger traffic; but even allowing for this, the increase is extraordinary, especially in view of the stationary or declining condition of this traffic in all the other years since the war. From 1881 to 1882, however, the growth was but moderate.

Freight traffic continued to increase with but slight interruptions until after 1875. The whole 402 miles of the Iowa lines were worked first in 1871 for a whole year. From 1871 to 1875 the increase in freight traffic was but 8.4 per cent., and nearly all this gain was lost in 1876, and in 1877 the freight traffic was an eighth less than in 1875. But since 1877, progress has been rapid, as on many roads, and in 1882 the freight traffic was 27½ per cent. greater than in 1877, and 11½ per cent. more than in 1875.

The distribution of traffic in the two directions is ex-

ceptionally favorable on the Illinois Central. There is, on the average, about as much freight moved south as north.

The freight movement (in millions of ton miles) northward and southward over the road has been for eleven years:

Year.	South.	North.	Year.	South.	North.
1872	142.9	129.4	1878	144.1	162.3
1873	161.4	114.4	1879	170.2	165.2
1874	165.4	108.1	1880	198.4	182.9
1875	160.3	124.3	1881	204.8	181.2
1876	121.0	143.6	1882	196.9	220.9
1877	124.7	124.6			

Previous to 1876 we see that the southward movement was largest; in 1874 it was not less than 60 per cent. of the whole, but in 1876 it was only 46 per cent. But in the eleven years there have been but three—1876, 1878 and 1882—that the north-bound movement was largest. The variations from equality, however, have been very small compared with many other roads. Some of the most important have three or four times as much in one direction as in the other, the trunk lines among them.

This evenness in the movement in the two directions is favorable to large train loads and low working expenses—or would be if the traffic were even on the several lines, and not made so by a predominating south-bound movement on one division being balanced by a predominating north-bound movement on another, which is quite possible. The working expenses are an unusually small percentage of the earnings, but not remarkably low in amount, as the average rates are higher than on most roads in Illinois. But the average freight train load is not large, but small rather. Last year, when it was considerably larger than ever before, it was 129½ tons. This probably is due to the fact that an overwhelmingly large proportion of the traffic is local—78 per cent. in 1882. In respect to rates and train-loads it contrasts with its next neighbor, the Chicago & Alton, as follows:

	Rate per mile.	Per ton.	Per pass.	—Av. tr. load.—	P. c.
Illinois Central	1.42 cts.	2.39 cts.	129.5	43.2	44.9
Chicago & Alton	1.36 "	1.95 "	189.0	65.3	54.6

The average expense per ton per mile would be then about 0.639 on the Illinois Central, against 0.688 on the Chicago & Alton and per passenger mile 1.075 cents on the Central against 1.065 on the Alton—very nearly alike. It is the difference in the rate that makes the proportion of expenses so much smaller on the Illinois Central. Considering that the Chicago & Alton has train-loads 50 per cent. larger, we should not expect it to cost more on it. The earnings and expenses per train-mile on the two roads were:

	Receipt.	Expense.	Profit.
Illinois Central	\$1.71	\$0.77	\$0.94
Chicago & Alton	2.02	1.15	0.87

These comparisons, however, are more interesting than profitable; for though the two roads are neighbors for along distance, they are quite unlike in many essential particulars. The Chicago & Alton is the chief line between Chicago and St. Louis, and has a large share of the through traffic between Chicago and Kansas City and St. Louis and Kansas City. The through traffic of the Illinois Central is much less important. Then the latter's coal traffic is much less important.

The flourishing condition of the Illinois Central's leased "Southern Division" (by the purchase of which it made large profits, and by the lease of which it has become a through line from Chicago and St. Louis to New Orleans), and the improvement of its long stationary Iowa lines, which seems likely to continue, make its future very promising. Its obligations are extremely light, and by far the larger part of its net earnings goes to its shareholders.

The Illinois Central took possession of the Chicago, St. Louis & New Orleans road Jan. 1 last, so that the report for 1882 may be said to conclude one period in the history of the company. As the leased road has been controlled in its interest for many years, it will not greatly change its position; but we shall hereafter have, doubtless, reports of the results of its operation, which have not been given heretofore, not even the amount of working expenses being published, but only the gross earnings. We have noted heretofore that it sometimes has larger earnings per mile than almost any other Southern road east of the Mississippi.

BUYING OFF COMPETITORS.

Receiving pay for not working seems on its face absurd and demoralizing, but we have several times proposed it as a rational remedy for some evils quite often occurring in railroad competition, and now it is announced that this policy has been adopted by the Southwestern Association with regard to the line between St. Louis and Kansas City formed by the St. Louis & San Francisco and the Kansas City, Fort Scott & Gulf roads. By this route, in order to take freight from Kansas City nearly due east to St. Louis, a dis-

tance of 277 miles by the Wabash, 283 by the Missouri Pacific and 323 by the Chicago & Alton, it was carried from Kansas City due south 99 miles to Fort Scott and thence southeastward 102 miles to Springfield, Mo., by the Kansas City, Fort Scott & Gulf road; and thence northeast 240 miles to St. Louis by the St. Louis & San Francisco, making a line 442 miles long, or 60 per cent. longer than the shortest route in the Southwestern Association and 25 per cent. longer than the longest.

It may be said, and doubtless has been claimed by the Association roads, that the line via Springfield is not entitled to any of the profits on this St. Louis-Kansas City traffic, because it is so circuitous. But this does not follow by any means. On wheat from Kansas City to St. Louis the rate is \$3 per ton. If by the shortest route the expense is 60 per cent. of this sum, it makes it \$1.80, or 0.65 cent per ton per mile. If the expense per ton per mile is as great by the long route (and having no greater terminal expenses than the short lines, it should not be so great), then the cost by it is $0.65 \times 442 = \$2.87$ per ton, leaving a profit of 13 cents per ton. But the question with the companies with the long line is not the actual expense for carrying the Kansas City traffic, but only the addition to the expenses which is caused by the addition of that traffic. The larger part of the expense of maintaining the road and nearly all the general expenses will be the same whether this traffic is taken or not. No addition to capital is required except for rolling stock, and at times not for that (when the other traffic does not fully employ the existing stock). Very likely the addition to the expenses on account of the addition to the traffic would not be one-half of 0.65 cent per ton per mile, or \$1.44 cents from Kansas City to St. Louis. Furthermore, the St. Louis & San Francisco road very likely has a great many cars going west empty. To haul these filled with lumber will cost very little more than to haul them empty.

On the whole, the question with the long line may put itself something like this:

100 tons of freight per week at \$2.50 per ton.....	\$250
Addition to expenses at \$1.50.....	150
Addition to profits.....	\$100

Now, if this is all, if other traffic of these roads is not injuriously affected by the low rate on Kansas City traffic (as it almost certainly will be if the short lines can compete for it), then they are justified in seeking the traffic. The managers of every company are bound to add a hundred dollars a week to their stockholders' profits, if they can do it without injury to the public. The fact that their making a hundred dollars may cause some other company to lose a thousand will not change their duty. They must adopt the policy which will give the best result to their own company, taking into consideration all the results—including the losses by the competition of the roads they may injure, and the probability of the construction of new lines by those injured roads which will reduce the profits of the aggressors thereafter. (As, for instance, the Chicago & Alton or the Missouri Pacific might have been led to build a line to Fort Scott which would hurt the Fort Scott & Gulf road more than it could profit by the St. Louis-Kansas City business.) They cannot justify themselves to their stockholders unless they utilize the full earning capacity of their roads.

But this is all that is required of them. There is no reason why they should accept a traffic at much less than the average rates if they can make as much profit without. If the roads which lose a thousand dollars a week by these roads competing for a traffic which they carry at greater cost and for a lower price will pay them the hundred dollars a week which they can make out of it, by accepting it and withdrawing from competition they will utilize the full earning capacity of their roads just as much as if they carried the traffic, and the gross expense of carrying the total amount of traffic will be materially reduced; for we must remember that while the addition to the expenses of the long line, by its taking a portion of the traffic, was but moderate; the reduction of the expenses of the other lines in consequence of losing a portion of it was almost nothing; and the total expense of carrying the traffic was increased.

The action of the Southwestern Association in this matter is an indication that some of the railroad companies at least recognize the fact that every road is entitled to all the profit that it can make, even if the profit is very small and causes a competitor a much greater loss, and that it is proper in order to prevent these great losses for the companies which would suffer them to pay the competitors who own the indirect routes all that they could make on the business. If you have a business on which you make a profit of a thousand dollars, and I can make two thousand dollars on the same business, I certainly cannot expect you to give me the business for nothing or for any-

thing less than what you can make on it, and no one else should or will complain if I buy your business.

But there is the danger, which is probably what has made the railroad companies loth to adopt this policy, that the long lines which carry for less than the rate and more than the cost by the short lines will value their business not by what they can make by it, but by what they can cause their competitors to lose. If the line via Springfield could on the average make a profit of a hundred dollars a week and cause a loss of a thousand dollars a week to its competitors, it is tempted to say: "You can make a thousand dollars a week if we go out of this business. For this privilege of making a thousand dollars a week we shall charge you five hundred dollars; it will be a great bargain for you." Now this is simply blackmail; and it is this disposition to charge for the harm they may do others instead of the advantage for themselves which they relinquish, doubtless, which has led railroad managers generally, perhaps, to look upon any allowance to a very circuitous line as blackmail. But the two things need to be distinguished carefully. Every line is entitled to all the profits that it can make for itself, but to no part of the losses which it has power to cause other lines to suffer.

This is a matter which comes up constantly and more and more frequently as new roads are completed and through rates are maintained so as to afford a tolerable profit. When rates are such that the direct lines from New York to Chicago or from St. Louis to Kansas City barely earn the expenses incurred for this traffic, and the entire interest on the cost of the roads is paid by the other traffic, then such long lines as that from New York via New London and Montreal to Chicago, or that from St. Louis via Springfield to Kansas City carry none of the traffic, because they can only lose by it; but when the rates are such that this traffic pays as much or half as much profit as the average traffic, then some of the long lines can make profit on what they are able to obtain, and they are bound to get it, in one way or another. Thus as railroad wars become less frequent, the competition of long routes becomes more common and will need to be provided for; and not unfrequently, it seems to us, the best provision for it will be the purchase of the traffic of the lines which can make the smallest profit on it by those which can make the largest.

THE CLEVELAND, COLUMBUS, CINCINNATI & INDIANAPOLIS RAILWAY.

The Cleveland, Columbus, Cincinnati & Indianapolis Company in 1867, before the consolidation with the Bellefontaine Company, which gave it its line to Indianapolis, had a capital stock of \$6,000,000 and a funded debt of only \$425,000. Its net earnings that year were \$554,507. In 1864, with about the same capital, they were \$901,344, and a dividend of 15 per cent. was paid. That, however, was at the time when currency was most depreciated, and the \$901,344 of net earnings would probably not have made more than \$500,000 in gold. When the Bellefontaine Company was absorbed, adding 203 miles to the property (and making it just what it is now in mileage owned), to equalize the values of the stock, the Cleveland stockholders were given 120 shares of new for 100 of their old stock, or \$7,200,000 altogether, the Bellefontaine shareholders taking share for share for their \$4,420,000. The funded debt of the consolidated companies was \$1,965,000. And of the capital stock the company held in its treasury \$1,159,100, which was an investment made by the Cleveland company in the Bellefontaine company to secure the construction of the connection. To pay 7 per cent. on the stock and the interest on the bonds of the consolidated company required net earnings amounting to about \$870,000. They did not quite reach this sum in 1868, but a 7 per cent. dividend was paid then and for every following year until 1875. Meanwhile the passenger traffic was stationary, the freight traffic grew very rapidly, and the gross earnings, as reported, increased 64 per cent., and the net earnings 68½ per cent. from 1868 to 1873. In 1874 there was a sudden falling off of nearly one-sixth in gross and of no less than 44 per cent. in net earnings; the reduction of the latter amounting to about \$590,000, which was about 4 per cent. on the stock then outstanding.

Meanwhile the capital had not stood still. To secure a line to St. Louis this company agreed with the Fort Wayne Company to take half the stock and to build the Indianapolis & St. Louis road, from Indianapolis to Terre Haute, and to guarantee the rental on a lease of the St. Louis, Alton & Terre Haute to this new company. The Fort Wayne at the time was an independent company, working in connection with the Cleveland company to make a line between Chicago and Cleveland, and endeavoring to prevent the diversion

of the St. Louis traffic from its road to the Pan-handle by the Pennsylvania, which controlled the Terre Haute & Indianapolis. The investment in Indianapolis & St. Louis stock was \$300,000. There was a third company to guarantee the rental of the Alton & Terre Haute, but it soon became bankrupt and unable to fulfill its obligations. The Indianapolis & St. Louis net earnings were just about equal to the interest and rentals until after 1873. From that time on there was a yearly loss to be made good by the guaranteeing companies, amounting to \$2,214,400 by the end of 1881, and apparently to \$620,000 in 1882. One-half of the loss fell on the Cleveland company until the relations with the Pennsylvania Company were changed by agreement last year.

In 1871 the Cleveland company set about acquiring an independent entrance into Cincinnati. Before it had used the Little Miami Railroad, which had been leased by the Pennsylvania. The new connection was had by the organization of the Cincinnati & Springfield Company, which built 43 miles and leased 32½ miles of road, and then leased its whole property to the Cleveland company. It issued \$2,000,000 of first-mortgage 7 per cent. bonds, \$1,000,000 of which were guaranteed by the Cleveland company, and \$500,000 second-mortgage bonds. By the terms of the lease the Cleveland company paid all expenses, taxes, rentals and interest, and was to turn over the balance of earnings, if any, to the lessor. If there was a deficit, the lessee paid it and charged it to the lessor. There always was a deficit to be paid by the lessee, which by the end of 1877 amounted to a million and a quarter. At the end of last year the advances to this company (partly for improvements) amounted to about \$2,160,000. In 1882 it was charged with \$169,209 for land purchased for it (chiefly in Cincinnati) and \$279,020 for deficit in operating.

The operations by which the company secured connections with St. Louis and Cincinnati were thus very costly. Mainly in consequence of them, the stock was increased from \$10,460,000 outstanding in 1869 to \$14,991,000 in 1872; and the funded debt, which was \$1,965,000 at the time of the consolidation, rose to \$4,697,000 in 1874 and \$6,170,000 in 1875.

From 1868 to 1874, inclusive, the aggregate net earnings of the company were \$7,418,000, and it paid out for interest, rentals and dividends meanwhile, as nearly as we can ascertain, about \$8,700,000, and increased its stock \$4,500,000 and its bonds \$2,732,000. The reported net earnings, which had averaged over \$900,000 a year for over three years before the acquisition of the St. Louis and Cincinnati connections, and which were reported at an average of \$1,310,000 for three years after 1870, fell to \$747,000 in 1874, and never reached that figure again until 1879. The charges incurred on account of these connections, together with the addition to the funded debt, increased immensely the charges against the income, while the income itself grew less. Dividends were passed for four years, and yet there was very little surplus accumulated—certainly not more than was necessary for the improvements which a road situated like it, in the midst of competitors, is absolutely compelled to make, and for which capital could not then be obtained otherwise except at great and permanent disadvantage. But the increase of the capital account was checked. There has been scarcely any addition to it since 1875.

When business began to revive in 1879, this company felt it like others in its situation. In 1880, when with a good traffic there were well sustained through rates the year round and in both directions, such as there had not been before for years, the net earnings of this company were twice as great as in 1878, and 2½ times as great as in 1877. A dividend of 2½ per cent. had been paid in 1879; in 1880 5 per cent. was paid, and it seemed probable that a higher rate could be paid thereafter. But the railroad war and the poor crops of 1881 reduced somewhat the net earnings, and the dividends were again passed: in 1882 the net earnings were larger, but the surplus was about the same. In these two years it has been about \$1,673,000. From last year's profits a dividend of 2 per cent. was paid this year. But in these two years there have been additions to the property (chiefly equipment) amounting to \$634,358; the advances to the Cincinnati & Springfield have been increased \$563,726, and those to the Indianapolis & St. Louis Company have been \$723,340. The latter may be considered as the price paid for securing sole control of the line to St. Louis. The former was partly the price of improved facilities, and partly a burden which was incurred in securing this Cincinnati connection. This has been, substantially, the disposition of the profits which otherwise might have gone for dividends. As the whole of the interest of the Cincinnati & Springfield has to be paid by the Cleveland company, under any circumstances, the

expenditures for its improvement may be looked upon as for the improvement of the Cleveland company's property. It not only owns half the shares, but it has made advances, as we have said, amounting to \$2,160,000 (nearly twice the whole capital stock), which will have to be paid before the Cincinnati & Springfield stock can receive any dividends. It may be looked upon, then, as part of the Cleveland company's property, for which an extravagant price was paid, to be sure, but which nevertheless is an essential part of the company's system, which must be made and kept effective, and the burdens of which must be borne.

There have been great complaints from the English stockholders because in the last two years, when the net earnings were as large as in 1880, no dividends were paid. It is the English custom to divide the whole of the surplus, and to obtain special authorization for additional expenditures on capital account, which are almost invariably raised by new issues of securities.

In the case of the Cleveland company, very considerable expenditures, varying in amount in different years, have been compelled on account of the Cincinnati lease and the Indianapolis & St. Louis guarantee, which were at least nominally additions to the assets, but which the company had no option about. So far as these advances are concerned, the consent of the stockholders could have made no difference. The expenditures for the improvement of the Cleveland company's own road, and of the Cincinnati line, and part of the advances to the Indianapolis & St. Louis may be looked upon as expenditures on capital account which it was possible not to make, or to provide for by new issues of securities. Probably no one familiar with the situation will say that the improvements were not necessary—not simply in the sense that they would bring additions to profits which would justify them, but that they were required to prevent a decline in business and profits. A railroad like this, with numerous competitors, some of them in the most efficient condition for attracting traffic and carrying it at low cost, cannot stand still. If it does not go forward it will fall back. Others may judge whether it would have been wise to raise the capital for these improvements by selling shares or bonds in 1881 and 1882.

With regard to the advances to the Indianapolis & St. Louis, it is certainly almost indispensable that the company should have a St. Louis connection. The interest which it already possessed in the Indianapolis & St. Louis Company made it best to secure the connection through this company. The circumstances made it possible to secure sole control. It was the principal creditor of the company, and it has substantially taken possession of the property of this creditor by paying what was necessary to the other creditors. It now owns the whole of the Indianapolis & St. Louis stock; and jointly with it leases the St. Louis, Alton & Terre Haute. It will, therefore, get the whole of the profit if there is any, and suffer the whole of the losses of the line from Indianapolis to St. Louis, and be able to control the direction of the whole of its traffic.

The expenditures on this account could hardly have been avoided, it would seem. Whether or no they result in any addition to the profits of the company, they still were unavoidable; for if the Indianapolis & St. Louis had been abandoned to its fate, there can be no question that the Cleveland company would lose largely. Simply as a matter of defense, something of the kind had to be done. Would it have been advantageous to raise the money for this purpose by issuing more bonds, and to pay out the net earnings in dividends? This policy of increasing capital account and paying dividends was followed, as we have seen, previous to 1877; and the result, we have also seen, was to leave so narrow a margin between fixed charges and net earnings that the company came dangerously near bankruptcy. Traffic earnings and profits have increased of late years, it is true, but there is not yet so large a margin over interest and rentals as to make it safe to increase the funded debt, especially for purposes which may not increase profits beyond what they now are, however effective they may be in preventing a decrease. In this country the tendency of rates is downward, and no one company, and generally not all companies together, can prevent it. Great progress is also made in increasing the accommodations offered to the public and in decreasing the expense of doing the work. Any company that lags behind suffers—loses traffic if it cannot offer as good service as its rivals, and loses profits if it cannot reduce its expenses as fast as they do. No longer ago than 1877 the average expense per ton per mile on the Cleveland, Columbus, Cincinnati &

Indianapolis Railway was 0.849 cent. Where would the company be to-day if it could work no cheaper, its average receipt having never since been as much as its average expenses in 1877, and only 0.706 cent in 1882? Only by keeping a road like this, four-fifths of whose freight traffic is through and five-sixths of whose traffic is freight, in condition to work at the lowest possible cost are any profits possible. Improvements must be made whether they add to the profits or not. Of late years the increase in the prices of material and labor have only increased this necessity, otherwise there would be a great increase in the cost of working.

It may help to understand the change in the situation of this company to compare the figures for capital, equipment, net earnings over interest charges, etc., in 1864, when the 15 per cent. dividend was paid, in 1868, which was the first year of the consolidation, and in 1882, as follows:

	1864.	1868.	1882.
Miles owned.....	188	391	391
Stock and debt.....	\$6,941,000	\$12,425,000	\$21,356,600
Interest.....	35,000	137,550	498,016
Net earn. over interest..	901,244	739,513	851,032
Dividend, per cent.....	15	7	2
Ton-miles.....	52,779,560	95,130,679	447,411,484
Rate per ton mile.....	2.642 cts.	1.800 cts.	0.706 ct.
No. locomotives.....	44	83	154
No. pass. train cars.....	36	80	110
No. freight cars.....	788	1,235	5,399

The increase in capital stock and debt from 1864 to 1868 was about in proportion to the increase in mileage and equipment. The increase of \$9,600,000 since 1868 (substantially all made by 1875) has been without increase in mileage. The vast increase of nearly 400 per cent. in freight traffic has brought an increase of 119 per cent. in profits from freight. When the loss on the Cincinnati & Springfield road was paid, the surplus available from dividends was nearly a fifth less in 1882 than in 1868.

The report for 1882 compares more favorably with that for 1881, and especially with that of the exceptionally good year 1880, than might have been expected. There was a decrease of 7 per cent. in freight traffic, but an increase of 7½ per cent. in passenger traffic. The average rates were somewhat higher in both branches of traffic, resulting in an increase of 2 per cent. in freight and 11 per cent. in passenger earnings, and with a trifling decrease in working expenses, this made an increase of 4½ per cent. in net earnings, amounting to \$68,370. The average rate received per ton per mile was but 0.706 cent., which is lower than has been reported heretofore by any road in 1882 except the Philadelphia & Erie, whose average rate was but 0.615 cent. The rate on the New York Central was 0.730 cent., on the Erie 0.805, on the Pennsylvania (Pennsylvania Railroad Division) 0.817 cent.

The effect of the railroad war was felt especially on west-bound traffic in the first half of the year, and the effect of the bad crops of 1881 on the east-bound traffic in the same half of the year. The difference in rates and traffic between the two halves may be judged by the fact that the net earnings were but \$437,369 in the first half of the year, and were \$1,040,453 in the last half. In February they were \$31,345, in August, \$278,686—nearly nine times as much. Yet the expenses were larger in the last half of the year. The first half of this year will doubtless more nearly resemble the last half than the first half of 1882 in traffic and rates.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Carson & Colorado.—Extended from Benton, Cal., southward 15 miles. Gauge, 3 ft.

Cincinnati & Eastern.—Extended from Peebles, O., east to Mineral Springs, 5 miles.

Memphis, Selma & Brunswick.—Track laid from Holly Springs, Miss., westward 12 miles. Gauge 5 ft.

Northern Pacific.—Extended westward to Bozeman, Montana, 10 miles.

Rochester & Pittsburgh.—Track on the Buffalo Division is extended north by west to Cattaraugus Viaduct, 9 miles, and south by east to Colden, N. Y., 13 miles.

Warren & Farnsworth Valley.—Extended from Garfield, Pa., to Vandegrift, 1½ miles. Gauge, 3 ft.

This is a total of 65¼ miles, making 394 miles thus far reported for 1883, against 1,001 miles reported at the corresponding time in 1882, 501 miles in 1881, 753 miles in 1880 and 241 miles in 1879.

THE WABASH REPORT for 1882, which we can but glance at before going to press, shows an improvement over the very bad result in 1881, but by no means a satisfactory result of the year's operations. In 1881 the net earnings were \$1,142,112 less than the fixed charges, and by paying a dividend on the preferred stock a balance to credit of income of more than a million at the beginning of the year was converted into a balance of \$1,453,000 to debit of income. In 1882 the net earnings were \$583,022 less than the fixed charges, increasing the debit bal-

ance to \$2,035,880. The favorable feature is that the company's loss was only about half as great as in 1881. It must be said that both of these years were very bad for the Wabash, the light crops of 1881 affecting its business more than that of any other company in the country, perhaps, and doing so in the last half of 1881 and still more in the first half of 1882, while further great losses at the same time were incurred by the railroad war. Notwithstanding this, the company has not made the gains since harvest that might have been expected, though as it is a great corn road, not too much of an improvement should have been expected from it then. The earnings reported in each half of the year have been:

	1882.	1881.	Increase.	P. c.
First half.....	\$7,411,248	\$6,227,266	\$1,183,982	19.0
Second half.....	9,440,442	8,240,524	1,199,918	14.6
Year.....	\$16,851,690	\$14,467,790	\$2,383,900	16.6

As the gross amount of increase was nearly as great in the first half as in the last half of the year, this may seem to contradict what we have said above, that the comparison for the first half is with a period of good traffic in 1881, and of the last half with a bad one that year. But this puzzle is explained by the change in the mileage. The average worked was:

	1882.	1881.	Increase.	P. c.
First half.....	3,350	2,480	870	35.1
Second half.....	3,453	3,078	375	12.2

Thus in the first half of the year the comparison was with a much smaller property, and it was the 870 miles more of road, doubtless, that earned all the increase of \$1,184,000 in earnings, and something more. Comparing the earnings per mile will make it plain:

	1882.	1881.	Inc. or Dec.	P. c.
First half.....	\$2.512	\$2.511	Dec. \$99	12.0
Second half.....	2,853	2,677	Inc. 176	6.6
Year.....	\$4,954	\$5,205	Dec. \$241	4.6

Thus in the last half of the year there was a gain of 6½ per cent. in earnings per mile, against a loss of 12 per cent. in the first half. The change in mileage in the last half was not very great, and perhaps a larger increase in earnings was to be expected, in view of the better crops and well maintained rates. But the corn movement, it must be remembered, was much lighter in 1882 than in 1881, in the last half as well as the first half of the year, and the Wabash is now perhaps the greatest of the corn roads. We should have expected to feel the influence of the larger corn crop in the earnings since 1882, however; but there was scarcely any increase in January and February over 1882—less than \$14,000.

While the gross earnings increased nearly \$2,400,000 in 1882 (16½ per cent.), the working expenses increased but \$872,000 (8 per cent.), so that there was an increase of \$1,512,092 in net earnings, which is no less than 41 per cent. And this is in spite of a general tendency to increase expenses more in proportion than earnings. The expenses per mile were reduced \$454 (13.2 per cent.), while the earnings per mile fell off, as we have seen, only \$241, or 4.6 per cent.

As this large increase in net earnings exceeded the deficit in 1881, there would have been none last year but for the increase in fixed charges, which was from \$4,456,707 to \$5,209,614—the inevitable consequence of an increase of more than one-fifth in the road worked. There must be some increase in these charges this year, but it will probably be moderate, as the additions have not been large since June last. The balance sheet shows an increase of \$4,646,000 in the funded debt and of \$1,537,000 in the loans payable during the year, but a decrease of \$891,000 in the floating debt.

We cannot give the capital per mile of this company, because in no statement of its mileage are the lines leased distinguished from those owned. The average amount of interest and rentals per mile of road worked in 1882 was \$1,531—not a very large amount, but too large for a road whose net earnings, after paying taxes, etc., were but \$1,387 in 1882.

Not much of the Wabash system is in new country, but its lines are in a very fertile and prosperous country, which grows, though less rapidly than some of the country further west and north. A considerable improvement on the results of the last two years, however, is to be expected, whenever crops are fair and rates maintained.

THE NEW YORK RAILROAD REPORT for 1880-1881 was not only very late in coming, as we noted when it appeared, but it was a sham when it did come, a very large part of the data required from and returned by the companies and given in previous reports having been omitted entirely. In this way, for instance, the report of the lessee of the Albany & Susquehanna Railroad, which the previous year occupied eight pages, has been reduced to two, the omissions being the itemized account of additions and betterments, the table of branches, the larger part of the table of "characteristics of road," the whole of the "description of freight moved," destination of passengers and freight and average rates, and worst of all, all the details of the working expenses; and also the whole data concerning accidents. The same policy of condensation by omission—the easy way of abridging—has been followed generally, so that the Erie report, which took 33 pages in the 1880 report and gave valuable information not given in the company's report to its stockholders, is contained in four pages, more than half of which is occupied by the balance sheet and list of directors and officers. The New York Central report is likewise got into four pages, the list of officers and directors covering more than one, and the statement of working expenses occupying four lines.

In this way, the space occupied by the separate reports

of the steam railroad companies covers 448 pages in the report for 1881, against 810 in the report for 1880. The reports of street railroad companies, which have always been so incomplete as to have little value, have not been trimmed down to the same extent; they cover 139 pages, against 205 in 1880; but the omissions are precisely what was most valuable, namely, the details, which have always been too meager, of the working expenses.

Proper tabulation and editing would make it possible to include all the information returned in a small part of the space of the last report even. The arrangement has always been such as to give a fat job to the printer and seems to have been made solely in his interest.

THE ILLINOIS CENTRAL CITY AND SUBURBAN TRAFFIC has developed to important proportions. The company's line is either on the lake or on its edge for several miles from its Chicago station south, and crossed by no streets, so that it is liable to no obstruction, and it skirts the whole eastern edge of the city south of the Chicago River. This part of the city at the mouth is near the business centre and further south is one of the choicest quarters for residence. Thus by establishing numerous stopping places at the foot of streets on the lake shore the road is able to serve as a city railroad, much as the New York elevated roads do. It not long ago built separate tracks for its city and suburban trains, put on a special equipment, and ran trains at comparatively short intervals. It appears by the last report that about one-fourth of the total passenger traffic of the 1,330 miles of road worked is on these suburban trains, running over 15 miles of the Chicago and of the road. The number of passengers, passenger mileage, earnings and average rate per passenger and per mile of these trains for the last two years were:

	1882.	1881.	Inc. or Dec.	P. c.
No. passengers.....	2,694,309	2,537,141	157,168	6.2
Passenger miles.....	21,425,404	23,709,406	D. 2,284,002	9.7
Average journey, miles.	8.00	9.34	D. 1.34	14.3
Earnings.....	\$248,883	\$208,102	I. \$40,781	19.6
Average fare, cents.....	9.24	8.20	I. 1.04	12.7
Av. rate per mile.....	1.15	0.88	I. 0.28	31.8

The decline in traffic last year was doubtless due to the fact that a much smaller number of men employed in the construction of the town of Pullman used the road then, most of the building having been completed before 1882; and this also accounts for the higher average rate and the shorter average journey, Pullman being nearly the most distant of the stations reached by these trains. The total passenger traffic of the Illinois Central was 85½ millions of passenger miles in 1882 and 82 in 1881, so that, as we have said, one-fourth of this traffic is carried on these trains (31 per cent. in 1881). More of it is suburban than urban, doubtless, though the larger part of suburban traffic is to and from a place which is becoming substantially a part of the city. Though one-fourth of the traffic is on these trains, they make but 12¼ per cent. of the passenger earnings, owing to the very low rate. The work is done, however, with a comparatively small number of cars and locomotives and men, and ought to be profitable. A very heavy traffic is required to make such trains possible at such rates.

THE HEAVY GRAIN MOVEMENT which we noted as existing in the week ending March 3 continued through the following week, though there were signs of its falling off somewhat. Yet in the week ending March 10 the receipts of the Northwestern markets were larger than ever before when lake navigation was closed except the week before and the last week of 1882. A very considerable decrease from these figures will still leave the movement very large. The shipments of these markets were larger than ever before when the lakes were closed, and though about a sixth of these shipments even by the Mississippi, on which the barge lines have begun to run again, still the rail shipments of the week were positively the largest ever made in any one week, winter or summer, from the Northwestern markets. The importance of these heavy shipments to the railroads is increased by the fact that the winter rate was well maintained on them, though we are so near the opening of lake navigation. The exports, however, have grown smaller rather than larger, and perhaps it is because so large a proportion of the grain is required for domestic consumption that the railroads are able to get so large a grain traffic at full rates so short a time before the opening of navigation; and it is an indication that it will not be necessary to make very low rates after navigation opens in order to secure a good grain traffic.

The contrast with the movement at this time last year is striking. For the week to March 10, there is an increase of 257 per cent. in the Northwestern receipts, of 180 per cent. in the Northwestern shipments, and of 160 per cent. in Atlantic receipts. It is the contrast of the year of the heaviest movement ever known (at this season) with the year of the lightest movement since 1877.

THE SLOWER GROWTH OF AGRICULTURE than of other industries in this country is shown by comparing the statistics of persons "pursuing gainful occupations" returned by the census of 1870 and that of 1880. These statistics exclude most children, and nearly all women not working for wages. The numbers were:

	1880.	1870.	Increase	P. c.
Engaged in agriculture.....	7,670,493	5,923,471	1,748,022	29.5
other occupations, 9,721,606	6,583,432	3,138,154	47.7	

Total.....17,392,099 12,505,923 4,886,176 39.0
In 1870, of every thousand persons engaged in gainful occupations, 474 were tillers of the soil; but of every addition of 1,000 to their number up to 1880 only 358 became farmers, so that in 1880 only 44.1 per cent. of the population were engaged in agriculture. Of the large increase of population since the census was taken, doubtless a much

larger proportion than before has been attracted to other industries than agriculture, as we may know by the fact that there has been comparatively little increase of the acres under cultivation, but a very large increase in mining, manufacturing and building. We are doubtless becoming more and more a manufacturing people, and thus a larger and larger proportion of our farm products is required for home consumption, and the carriage of these for exportation becomes a less important part of the business of the railroads. But this development is very uneven. Manufacturing especially is likely to make progress by leaps, each one of which places it in advance of the requirements of the country. Then it remains stationary for a time, until agriculture grows up to it and beyond it, and we again make enormous exports of farm products. But on the whole the other industries grow faster than agriculture, and probably will do so more hereafter than heretofore, because the area of cheap agricultural land in the country is now very greatly reduced.

CHICAGO THROUGH RAIL SHIPMENTS EASTWARD for the week ending March 14 have been, for four successive years:

	1880.	1881.	1882.	1883.
Tons.....	67,413	52,968	47,567	69,696

Thus the shipments this year were 46½ per cent. more than last year, 31½ per cent. more than in 1882, and 3.4 per cent. more than in 1880. The newspapers speak of the shipments as unprecedented in March. For the first two weeks they have been; but for the rest of the month the shipments in 1880 were larger than they have been at any time this year, and in the week ending March 27 they were larger (87,690 tons) than they have ever been in any other week of any month. No such extraordinary receipts are expected in the last half of this month. The only other weeks that the shipments have reached 80,000 tons were that ending June 25, 1881 (the first of the railroad war), when they were 81,660 tons; and that to Jan. 28, 1882 (80,525 tons).

Of the shipments of the week this year 14.2 per cent. went by the Chicago & Grand Trunk, 24 by the Michigan Central, 18.7 by the Lake Shore, 21.8 by the Fort Wayne, 14.3 by the Pan-handle, and 7 per cent. by the Baltimore & Ohio. Thus the two Vanderbilt roads, which are entitled to 45.5 per cent. in the pool, carried 42.7 per cent.; and the two Pennsylvania roads, entitled to 35.5 per cent. in the pool, carried 36.1 per cent.

For seven successive weeks the shipments have been, in tons:

	Jan. 31.	Feb. 7.	Feb. 14.	Feb. 21.	Feb. 28.	March 7.	March 14.
	45,029	43,388	58,140	61,533	60,385	72,051	69,696

There is a slight decrease from the first week of March; but the shipments were still extraordinarily large, and they promise to continue large for some time, though a decrease from the shipments of the first two weeks of March is to be expected soon. Vessels begin to be chartered to carry grain to Buffalo, but the prospect is that navigation will open nearer the 1st of May than the 1st of April.

NORTHWESTERN RAILROAD EARNINGS are making a better showing this month than last. Then, as we showed last week, many showed a considerable decrease as compared with last year, as they had done in January also, in spite of a large increase in mileage. But the roads that have reported so far for the first two weeks of March have with one exception, an increase this year. The Chicago, Milwaukee & St. Paul, which in comparison with last year showed a decrease in earnings of \$118,378 (8½ per cent.) in February, and of \$75,536 in January, reports an increase of \$169,008 (25 per cent.) in the first two weeks of March. Thus the gain in these two weeks balances seven-eighths of the loss of the previous nine weeks. The Chicago & Northwestern, whose decrease in January was \$262,228 (16 per cent.), and in February \$209,268 (14½ per cent.), gained \$131,600 (18 per cent.) in the first two weeks of March. The St. Paul & Omaha, which lost \$24,495 (7½ per cent.) in January, and \$55,300 (16½ per cent.) in February, loses in March also, but only \$1,200 (½ per cent.). The St. Paul & Manitoba shows an increase of \$25,759 (9½ per cent.) in the first half of March, against a decrease of \$28,746 in February; the Northern Pacific an increase of \$56,700 (33½ per cent.) in March, against an increase of \$104,156 (39 per cent.) in February.

These roads are just beginning to feel, or are just about to feel, the movement of emigrants from the older states to Northwestern Iowa, Minnesota, Dakota and Manitoba, but chiefly to Dakota. So far, however, the increase in March is probably due chiefly to doing the work which was postponed by the February storms.

PAYING FOR FOREIGN CAR MILEAGE will do very well when the car is earning something, but cases are not unknown when a company has been called upon to pay 1½ or ¾ cents per mile (according to the time) for the privilege of hauling an empty car over its road. Not many years ago the New York Central found that it was hauling empty cars west which had come east loaded over some other road. A correspondent tells us that a few years ago a short Western road frequently carried empty cars on their way home from connections which had received them loaded from another road, and in all these cases this short road paid the usual rate for the use of the cars, though it had never earned a cent with them. This is one illustration of the evils which an effective system for car-accounting will prevent.

RICHMOND & DANVILLE EARNINGS we spoke of last week as having been very bad in February last year, and showing a large increase this year on that account. This

statement must have been due to a comparison with an incomplete statement of earnings in 1882—perhaps one for three weeks instead of a month. The February earnings of the roads operated by the Richmond & Danville Company have been, for the four last years:

	1883.	1882.	1881.	1880.
\$359,247	\$286,021	\$268,034	\$246,149	

There has been no change in the mileage. The earnings last year, therefore, were not unusually small, but 6½ per cent. more than in 1881, and 16 per cent. more than in 1880.

Foreign Railroad Notes.

The Swedish state railroads have determined to adopt an automatic brake constructed by Körting Brothers, of Hanover.

On many railroads in Europe of late years, when the passenger traffic is light and the trains are usually very small, there has been introduced a system of light trains, much like the trains on some suburban street railroads in this country, by which the train expenses have been very largely reduced. An Austrian company which has given the subject a great deal of attention gives as the requisites:

1. The use of small locomotives, burning but little coal, and run without a fireman, it being arranged so that the engineer need never turn his face from the front;
2. a moderate speed and quick-acting brakes;
3. the use of cars of the inter-communication system—that is, on the American plan—so that one man can serve the whole train both as conductor and brakeman;
4. acoustic communication between the engineer and the conductor—that is, a mouth whistle or bell-cord. A recent train of this kind consisted of a locomotive weighing 33,000 lbs., to which a compartment for baggage was attached, a four-wheeled third-class car, seating 48 passengers, and a combination car with a compartment for mails, a water closet and a compartment for 16 second-class passengers, the cars weighing 17,600 lbs. each. In this train the weight of engine and cars per passenger is 1,084 lbs., against 1,676 in an ordinary train where there are but two cars. The authorities permit four such cars to be used in a train, with a maximum speed of 18½ miles an hour. One train of this kind runs 100 miles.

At the end of 1881 there were 5,523 miles of railroad in operation in Italy, of which 110 miles had been opened within that year. Of this mileage 2,452 miles belonged to the state. It did not work 827 miles of this, which was leased to companies, but on the other hand it leased and worked 591 miles which belonged to companies. The population of Italy by the census of 1881 was 28,951,349, so that there were 5,243 inhabitants per mile of railroad, more than ten times as many as in the United States.

The equipment per mile of road was at the rate of 0.277 locomotive, 0.852 passenger car and 4.814 freight cars per mile of road. A still more significant measure is that there were seats for 31¼ passengers and room in freight cars for 46½ tons of freight per mile of road. The average service of the equipment was 21,202 miles run per locomotive (very large for Europe), 22,480 miles per passenger car and 9,740 per freight car.

The average cost of the roads had been \$94,617 per mile of road, of which \$8,321 was for equipment. This is more than 50 per cent. more than the average cost of the roads of this country.

The earnings in 1881 were at the rate of \$6,723 per mile, while the average shown for this country was \$6,688 by the census of 1880. No less than 46 per cent. of the Italian receipts were from passengers, however, and only 25 per cent. here. The working expenses in Italy were \$4,726 per mile or 70.3 per cent. of the receipts, and the net earnings were \$1,997 per mile. Here the expenses were \$4,065 and the net earnings \$2,623 per mile. Per train mile the gross earnings were \$1.56½, the expenses \$1.10 and the net earnings 46½ cents.

The East Indian mail, run weekly by contract with the British government between Bologna and Brindisi, the whole length of the peninsula, carried 1,155 passengers from Bologna to Brindisi in 1881, and 1,027 from Brindisi to Bologna—an average of 22.2 and 19.4 through passengers per train.

The number of employes was 66,016, or very nearly 12 per mile, against 4.8 per mile in this country. The average wages per year was \$214 per year, against \$466 in this country.

THE SCRAP HEAP.

Locomotive Building.

The Rhode Island Locomotive Works in Providence have just completed an order for five passenger engines for the Missouri Pacific road.

The Cleveland, Columbus, Cincinnati & Indianapolis shops in Cleveland are building a mogul freight engine, with 18 by 24 in. cylinders, and two more are in progress at the Galion and Brightwood shops. Three engines of this class have already been turned out this year.

The Rogers Locomotive Works in Paterson, N. J., are completing an order for 10 mogul freight engines for the Missouri Pacific road.

The Boston & Maine shops in Boston are building two double-ender passenger locomotives for use on the suburban trains of the road.

Car Notes.

The Cleveland, Columbus, Cincinnati & Indianapolis shops in Cleveland, O., have nearly completed three very handsome sleeping cars, and have begun work on three more. The cars are of the Pullman pattern.

The Union Parlor & Sleeping Car Co. has filed articles of incorporation in New York, with \$500,000 capital stock.

The Barney & Smith Manufacturing Co. in Dayton, O., is building ten new passenger cars for the Cleveland, Columbus, Cincinnati & Indianapolis road.

The Cincinnati, New Orleans & Texas Pacific shops have

lately turned out a number of freight cars specially fitted up for the transportation of fruit and vegetables from Southern points.

The St. Charles Car Works in St. Charles, Mo., have started up on an order for 100 box cars for the Atchison, Topeka & Santa Fe, and have several other orders to follow.

The Jackson & Sharp Co., Wilmington, Del., has just shipped to the Chicago & Northwestern road 10 of their standard first-class passenger coaches. They are finished on the inside entirely with mahogany; have handsome wood ceilings; seats upholstered in crimson and golden-brown plush. They are richly ornamented on the outside. The company has also sent to the Annapolis & Elkridge road some passenger and combination cars.

Iron Notes.

Dunbar Furnace Co. in Fayette County, Pa., has completed a railway from its furnaces to its new iron mines, 4 miles distant.

The new Pittsburgh Steel Works of Anderson, Dupuy & Co., are now in regular operation, with a full force.

The latest achievement of the great 17-ton steam hammer at the Black Diamond Steel Works of Park Brothers & Co. was the manufacture by it of a large roll for the sheet mill, the ingot weighing about 7 tons. This is said to be the first hammered roll ever made in this country. Heretofore they have been cast.—*American Manufacturer, Pittsburgh.*

Lanesboro Furnace in Berkshire County, Mass., whose buildings were destroyed by fire last June, is now ready to go into blast again.

Henry Clay Furnace in Reading, Pa., has been repaired and enlarged, and goes into blast this week.

The Alton Rolling Mill Co., has been organized with \$25,000 capital stock, to build a rolling mill in Alton, Ill.

The rolling mill of the Philadelphia & Reading Coal & Iron Co., in Reading, Pa., last year turned out 17,677 tons iron rails, 11,646 tons steel rails, 1,226 tons rail joints, 1,010 tons steel crop ends and 14 tons muck bar, a total of 31,573 tons. Of this product less than 1,000 tons was sold to outside parties, the Philadelphia & Reading Railroad Co. taking the rest.

Manufacturing Notes.

The Interlocking Switch & Signal Co. is fitting up a system of switches and signals on the interlocking system in the Cleveland, Columbus, Cincinnati & Indianapolis yard in East St. Louis. A signal tower to be placed near the track connecting the yard with the St. Louis Bridge will contain apparatus controlling 56 switches.

The Boston Belting Co. is filling an order recently received which calls for 64,198 ft., or 12.2 miles, of rubber belting.

The Rail Market.

Steel Rails.—Quotations continue at \$39 to \$40 per ton at mill, with no very large sales reported. The eastern mills are generally supplied with orders for some months ahead, and are not very anxious for business.

Rail Fastenings.—Spikes are quoted at \$2.75 to \$3 per 100 lbs., with a more active demand than for some time past. Track bolts are quoted in Pittsburgh at \$3.50 per 100 lbs. for square nuts, and \$3.60 to \$3.75 for hexagon nuts. Splice-bars 2.20 to 2.25 cents per pound.

Old Rails.—The market is very dull, and quotations are entirely nominal.

Attempt at Train Wrecking.

A dispatch from Lexington, Ky., March 16, says: "The incoming passenger train on the Louisville & Nashville road this evening encountered a piece of rail about 2 feet long, laid inside the track and fixed like a switch to throw the wheels from the track, but the obstruction slipped when the train came, and the lower end became imbedded in a tie. The train was moving about 20 miles an hour. The conductor had been warned of a tie placed on the track at the same spot earlier in the day and thrown off by a freight train. A man caught at the scene said he got on at Lexington, a mile from that place, and showing great willingness to come to Lexington, was let go. A brakeman declares he saw this man hiding near the scene of the attempted wreck."

A Dakota Girl on the Train.

A man traveling on a Dakota railroad approached a pretty girl who occupied a full seat and asked her politely if he might take part of it.

"Seat's engaged," she replied, pithily.

"Got some apples in my grip sack," observed the man, scratching his chin meditatively.

"Seat's engaged," repeated the girl, spreading her skirts out.

"Got some nice cakes and candies," mused the applicant, appearing to pay no attention to her.

"I tell you the seat's engaged," she answered, with a sniff of disdain.

"Nuts and raisins, fresh sandwiches, pie, all in the same grip sack," and the man looked at her sideways.

"Don't make any difference, seat's engaged," and she turned to the window as though she was tired of the subject.

"And a flask of the best whiskey that ever trickled down a woman's gullet," continued the stranger.

"How did you know I was only fooling about the seat being engaged?" murmured the Dakota girl, her face breaking into a wreath of smiles. "It takes a man to find out when a woman is having her little joke."

And nobody on the train had a better time than that man the rest of the trip.—*Bee Line Journal.*

A Long Train.

On March 10 a train passed over the New Jersey Division of the Lehigh Valley road, which consisted of 200 empty coal cars, some 70 of them being eight-wheel cars. The train was drawn by one of the new twelve-wheel engines.

A Movable Locomotive Headlight.

We have before us letters patent taken out by Messrs. James Allen and W. R. Musser, of this city, for an improvement in locomotive headlights. By simple and ingenious machinery, controlled by a rod at the hand of the engineer, the headlight can be turned in any direction, from front to rear, on a sliding platform, which has the width of the engine at its widest part. Any one who has got on a train at a way-station on a dark, rainy night will understand the value of this improvement. With it the engineer can command his entire train or the length of platform stations under a bright light by simply giving a few turns of the wrist. We understand that prominent railroad men think very highly of it. Any one can see that it will be of great use in many ways.—*Lynchburg (Va.) Advocate.*

Electrical Motors on the Elevated Roads.

It is said that experiments with electricity as a motive power are to be made on the elevated railroads in New York, the Manhattan Co. having decided to make a complete test. The motor to be used has been designed by Mr. Stephen B. Field, and the experiments will be under his charge. They will be made on the Thirty-fourth street branch, which is about one-third of a mile long, running from Third Avenue to the Hunter's Point ferry.

Telephone Service on a Railroad.

The Austrian Railway Co. has recently made use, on the Czeaslau-Tremosnitz and Tremosnitz-Prachowitz lines, of a telephonic service, arranged in such a way that the officials at any two of the stations can speak to each other, or one station can be put in communication with all the rest. Each station is furnished with the following apparatus: A wall telephone, supplied with a strong iron electro-magnet, an ordinary telephone fixed on the office table, a call-bell and a commutator.

A Caution.

Mr. E. O. Hill, Superintendent of the Eastern Division of the New York, Lake Erie & Western road, writes us as follows:

"I have been notified by officials of different Western roads that requests for passes, purporting to come from me, have been presented to them and in some cases honored, said requests having printed heading and bearing office stamp."

"In branding these requests one and all as base frauds and forgeries and as not being fac-similes in any respect, it might be well for me to add that I never have, as yet, made a request on any Western road for a pass. I have, however, in some cases issued a letter to our employees, when absent on leave, and desiring to travel through the West, addressed 'to whom it may concern,' certifying that bearer was employed on this division. Any letter purporting to come from me, other than as stated, is a forgery."

Fast Time.

The Cincinnati *Commercial Gazette* of March 19 says that on the previous evening an Ohio & Mississippi express train in trying to make up time ran from Milan to Cochran, Ind., 15 miles, in 16 minutes, which is pretty fast time.

Memphis Merchants on the Tennessee Railroad Commission.

The members of the Merchants' Exchange, in Memphis, Tenn., on March 13 adopted the following resolutions in opposition to the proposed railroad commission bill now pending in the Legislature:

"Resolved, That in any legislation providing for the establishing of a board of commissioners, we deem it important: 1st. That at least for the first term of the existence of such board its powers should only be advisory and not absolute. 2d. That terminal points and those having the benefit of water routes such be entitled to the benefit of such competition and such competitive rates, and this without being subject to any rules prohibiting discrimination. 3d. That the board should have discretion and railroads be allowed to make rates so as to foster and promote industrial enterprises in their infancy. 4th. That we are earnestly opposed to the bills now before the Tennessee Legislature, which do not embody these views."

A Narrow Escape.

One of the passengers on Conductor Harvey Lamb's Erie train 12 Tuesday morning was a boy about 17 years of age, who was on his way to his home in the East, having become tired, after a short trial, of life in the far West. When the train was approaching Owego and running at the rate of about 45 miles an hour, the boy, who had been asleep for some time in a rear day coach, suddenly arose to his feet and ran through the car toward the rear platform. His actions attracted the attention of a brakeman in the car, who followed and grabbed him just as he was about to jump from the rapidly moving train. When dragged back into the car the boy was as white as a sheet, and, in answer to questions, stated that he had been asleep and dreamed that some one was chasing him with the intention of taking his life, and that he only realized where he was and what he was doing when the brakeman grabbed him by the shoulder. It was a narrow escape for the young man, for had he jumped from the train he would either have been killed or seriously injured. He did not go to sleep again that night, and will probably never forget the narrow escape for his life that a dream cost him.—*Port Jervis Gazette, March 15.*

A Brave Conductor.

A special to the St. Paul *Pioneer Press* from Redwood Falls, Minn., March 13, says: "A lively smash of cars occurred on the Pacific Division of the Minneapolis & St. Louis Railroad near Excelsior Saturday evening. The unlucky train was the accommodation that left Minneapolis at 4 p. m., but was delayed. While nearing and ascending the grade known as the St. Louis hill, the train broke, the rear car—a combined coach, mail and baggage car,—with one box car loaded with lumber, separated from the rest of the train, but had not yet reached the grade. The break was discovered by Brakeman Corder, who notified Conductor Bob Brown, and the two cars, the rear one with passengers, baggage and mail, the other loaded with lumber, were stopped near the foot of the grade, the rest of the train going up hill. Six more loaded cars broke loose from the engine and began descending upon the two cars at the foot of the grade. As soon as Conductor Brown discovered the threatened calamity he and Corder ran to meet the rapidly descending section of six heavily loaded cars, whose speed had increased to 15 miles an hour. Brown caught hold of the iron steps on one side of the box cars and was jerked off the ground and swung in the air alongside of the cars, but holding on, he climbed to the cars and set four brakes before the descending section reached the cars at the foot of the grade, and thus, at the risk of his own life, averted a horror. As it was, the passengers were thrown from one seat to another, and against each other, sustaining several very severe bruises. Six or eight cars were more or less badly damaged, the ends of box cars being bursted out entire, and the draw-bars demolished, while the draw-bar and platform on front end of the coach were ruined."

Studying the Time-table.

"My dear," said Mr. Spoopendyke, running his thumb down the list of towns on the time-table and glaring helplessly at the columns of figures, "my dear, the man must have given me the wrong business. We can never get anywhere with this."

"Let's see," murmured Mrs. Spoopendyke, laying her hand on his arm and drawing the time-table toward her. "There's Boston Lv. and Albany Ar. 2:30 to 2:40. That's plain enough."

"It is, is it?" snorted Mr. Spoopendyke, abandoning the table and bending his eyes on his wife. "Think that's plain enough, do ye? Show me how you make it. If you've got this thing by the tail, wiggle it once for my information."

"Why," fluttered Mrs. Spoopendyke, "you just add 'em together. Ought's ought, four and three's seven; eight and two's ten, put down the ought and carry—"

"Carry swill to the hogs!" roared Spoopendyke, bracing himself in his seat and surveying his wife with marked disapprobation. "That's about as much as you know anyway. What's Boston got to do with it? What interest has Lv. and Ar. got in this thing? Got some kind of a notion that they own the road, haven't ye? Praps ye think one's a tunnel and the other's a bridge. Well, they ain't, and they're not half-baked females who don't know a time-table

from a dog law. Now, you let me figure this thing if you don't want to spend the balance of your life on the road."

"Certainly, dear," cooed Mrs. Spoopendyke, nestling up to her husband and glancing around the car to see if he had been overheard. "You can make it out if anybody can."

"Now, we started from New York at 10:30 a. m.," continued Mr. Spoopendyke, "and we got to Buffalo at 12:15 a. m. Then, according to this, we leave Buffalo at 12:35 and 12:40 for Chicago. What I want to know is, why we leave Buffalo twice?"

"I suppose it's to make sure of getting away from there," suggested Mrs. Spoopendyke, fastening her thumb and forefinger on the margin of the time-table with a death grip. "Maybe the engine leaves at 12:35 and the last car at 12:40," she added, as the new explanation occurred to her. "Anyhow, it is better to get away from there twice than stay there altogether, don't you think so, dear?" and she looked up at him confidently.

"S'pose anybody along the line of this road knows what you're driving at?" snarled Spoopendyke, hauling at his end of the time-table. "Let go, will ye? Engine leaves at 12:35! Last car leaves at 12:40! That's the idea! It took you to hit it! When I get time to fix you up with a cowcatcher and a schedule of cut rates, I'm going to start an opposition road with you! Now let this thing alone, I tell ye!"

"There it is!" exclaimed Mrs. Spoopendyke, flushing with another discovery. "I've got it now! Of course we've got to leave Buffalo twice to get to Chicago twice!" and Mrs. Spoopendyke settled herself back and regarded the table with much complacency.

"Oh, you've got it," roared Spoopendyke. "That explains it! This railroad is twins! Leaves everywhere twice and gets everywhere twice! Nobody would have ever found it out but you! All you want now is a misplaced switch and a coroner's inquest to be a through trunk line! Can't you see that it's two different trains that get in there at 7:40? S'pose they only run one train on this dod-gasted road? Got a notion that the train goes both ways at the same time? I know all about getting there as well as you do, but what I want to understand is how this train leaves Buffalo twice. Got it now? Think you've fathomed my design on this time-table?"

"Perhaps there are two different trains out of Buffalo!" hazarded Mrs. Spoopendyke.

Mr. Spoopendyke deliberately tore the time-table into a thousand pieces, dropped them carefully under the seat, buried his hands in his pockets and gazed out of the window.

"I don't care," soliloquized Mrs. Spoopendyke. "There can't two trains arrive anywhere without leaving some place, and, anyway, I suppose we'd get to Chicago just as well if we didn't understand about this Buffalo affair."

With which consoling reflection, Mrs. Spoopendyke settled herself in her seat and gave herself up to considering how that girl on the other side of the aisle would act if she knew how much her laughing and loud talking with her escort offended the more virtuous minded of her sex.—*Brooklyn Eagle.*

Pretty Well Smashed Up.

As train No. 4 on the Erie was going east Sunday morning, her engine, No. 123, met with a general smash-up near Cameron Mills, on the Susquehanna Division. Both of her side rods, one driving box, one main pin on left side and all the rod brasses were broken, while the back head of the left cylinder burst and the forward driving box journals were so badly sprung as to necessitate their being strung up. The engine was totally disabled and will have to be taken to the Susquehanna shops.—*Port Jervis Gazette.*

There can be no possible doubt that that engine was "totally disabled."

Lowering a Tunnel.

In rebuilding the Pittsburgh & Western as a standard-gauge road an extensive change was made at the Summit tunnel. Its bed was lowered 9 ft. without stopping a train. The work was accomplished by the excavation of the bed of the tunnel while the track was kept up by trestle-work. A row of blasts would be fixed ready for firing, and as soon as a train had passed through they would be touched off and the debris cleared up before the next train arrived. The track for the broad-gauge was laid 9 ft. below the narrow-gauge, and when all was ready cars were run in on the lower tracks and the trestle for the narrow-gauge knocked down and dragged out.

A Brake Suit.

The Westinghouse Air Brake Co., of Pittsburgh, began suit last week against the American Brake Co., of St. Louis, for infringement of patent. The complaint charges that the American Brake Co. is constructing, selling and using locomotive brake apparatus substantially the same in construction and operation as the apparatus to which the complainant has the exclusive right under letters patent granted to George Westinghouse, Jr. An injunction is asked for and the payment of damages to be afterward determined.

Looking Out for Trainmen.

The New York, Lake Erie & Western Co. is about to provide for the comfort and well-being of its engineers and firemen who are compelled to wait in Hornellsville while their trains are being made up anew. The company has converted a large room in one of its buildings into a dormitory. It is provided with twenty-three bunks, with nicely upholstered cushions. The room, which is large and well ventilated, is heated by steam and provided with every convenience for the comfort of those for whose use it is intended. The arrangement is not only one of great economy to employees, but it must prove of great convenience to the company, in that the officials know exactly where to find their men in case of any emergency.

A Large Passenger Locomotive.

The "Pilgrim," a new locomotive for the Old Colony railroad, designed to run on the New York line in connection with the new sound steamer "Pilgrim" during the coming season, has just been completed at the shops of the Old Colony Co. The new locomotive takes the place of the old inside connected engine, the "Pilgrim," the latter having had a very remarkable record, having been constructed about 30 years ago by the Ameskeag Manufacturing Co. of Manchester, N. H., and in constant use ever since. When first completed the old "Pilgrim" was called a very large and powerful machine, and was put to service on the Fall River steamboat train. But compared with the present "Pilgrim" this was a small affair. The new locomotive is one of the largest on the road, having the following dimensions: Diameter of cylinder, 18 in.; 24 in. stroke; of driving wheels, 72 in.; truck wheels, 30 in.; tender wheels, 33 in.; diameter of boiler, 52 in. at smallest point inside; length of fire-box, 72 in. inside; width of same, 35½ in.; number of boiler tubes, 212, each 11 ft. 6 in. long by 2 in. diameter; boiler made of steel-plate 7-16 in. thickness, and double-riveted fire-box of steel-plate 5-16 of an inch in thickness; flue sheets ½-inch back and ¾-inch front; total amount of heating surface, 1,265 square feet; boiler capable of running at 160 pounds pressure to the square inch; weight of engine

in working order, 85,500 pounds; tender, 57,800 pounds; total length over all, engine and tender, 52 ft. 8 in. The engine and tender are painted black, with scarcely any ornamentation. The automatic brake is used on tender and driving wheels. Two more locomotives of this class are to be built at once in these shops.—*Boston Herald*.

Trial of the Ward Brake.

A trial of the Ward brake and coupler was made on the Pittsburgh & Western road on March 17. The trial is said to have been very satisfactory in its results, and the train was stopped on a down grade while the engine had full steam on. The account received, however, does not give any particulars of the stop made, the time and distance taken, etc., and it is therefore impossible to judge of the actual results.

Old Locomotives at the Chicago Exhibition.

A special effort has been made to secure as many old locomotives as possible for the Railroad Exhibition in Chicago, the object being to illustrate as fully as possible the gradual development of the locomotive. A late dispatch says that there is a probability that Stephenson's "Rocket," the progenitor, as it may be called, of all locomotives, may be sent from England and occupy a place there. If it comes, the "Rocket" will be an exceedingly interesting exhibit.

The Vienna International Electrical Exhibition.

Among the exhibitors at the International Electrical Exhibition in Vienna will be the Société Anonyme d'Electricité at Paris; Zenger, of Prague; Hartmann, of Würzburg; Skoda of Pilsen; Charles Foster, of Birmingham; Busa, Lombard & Co., of Magdeburg; the Compagnie Continentale, Edison and the Société Electrique Edison at Paris; the Wiener Privat Telegraphen-Gesellschaft and many others. The Austro-Hungarian state railways will have a very full exhibition of the applications of electricity to signals and other purposes on railroads.

The time for receiving applications will probably be extended, at least for exhibitors from foreign countries.

A Train Robber's Confession.

A dispatch from Little Rock, Ark., March 21, says: "The Johnson brothers, two of the Fort Smith train robbers, in jail here, have confessed their crime. Gov. Johnson said the party were organized at Mrs. Herndon's, but the plan was not completed then, but there was an understanding that a train on the Little Rock & Fort Smith Railroad was to be captured and robbed. The party adjourned to meet at Mulberry, where a plan of operation was formed in the woods near that town. The intention was not to kill any one except in self-defense, and to avoid bloodshed unless absolutely necessary. The shooting was done under excitement and was entirely unnecessary. Jim Herndon, who was captured this morning near Huntsville, Madison County, fired the shot that killed the conductor. Cain Herndon went to McDonald, of the gang, to induce him to stop shooting, but McDonald shot at him supposing he was a passenger, when Jim shot McDonald in the face. The original plan was to capture the train and rob the passengers."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Allegheny Valley, annual meeting, at the office in Pittsburgh, April 10, at 11 a. m.

Atchison, Topeka & Santa Fe, annual meeting, at the office in Topeka, Kan., April 19. Transfer books close March 19.

Boston & Maine, special meeting, in the City Hall in Lawrence, Mass., March 28, at 10:30 a. m., to vote on the proposed lease of the Eastern Railroad.

Chicago & Northwestern, annual meeting, at the office in Chicago, June 7.

Eastern, special meeting, at the Meisner in Boston, March 28, at 11 a. m., to vote on the lease of the road to the Boston & Maine; also on accepting the act authorizing the issue of preferred stock.

New York Central & Hudson River, annual meeting, at the office in Albany, N. Y., April 18, at noon.

Pennsylvania, annual election, at the company's office in Philadelphia, March 27. Polls will be open from 10 a. m. to 6 p. m.

Railroad Conventions.

The *General Time Convention* will hold its spring meeting at the Lindell House in St. Louis, April 11.

The *Southern Time Convention* will meet at the National Railway Club Rooms, No. 46 Bond street, New York, April 18.

The *Car Accountants' Association* will hold its annual convention in Philadelphia, May 22.

The *General Baggage Agents' Association* will hold its next semi-annual meeting at the Tremont House, Chicago, Aug. 8.

Technical Meetings and Conventions.

The *Master Car-Builders' Association* will hold its annual convention in Chicago, beginning June 12 next. The meeting will be held in the Grand Pacific Hotel. The charge at that hotel to members will be \$3 per day for ordinary rooms.

The *Master Mechanics' Association* will hold its annual convention in Chicago, June 19 next.

Dividends.

Dividends have been declared as follows:

Boston & New York Air Line (leased to New York, New Haven & Hartford), 2 per cent., semi-annual, on the preferred stock, payable April 1.

Dubuque & Sioux City (leased to Illinois Central), 3 per cent., semi-annual, payable April 16. Transfer books close March 31.

Manhattan, 1½ per cent., quarterly, on the first-preferred stock, payable April 2.

New York, Lackawanna & Western (leased to Delaware, Lackawanna & Western) 1½ per cent., quarterly, payable April 2.

Oregon & Transcontinental Co., 1½ per cent., quarterly, payable April 16. Transfer books close March 31.

Foreclosure Sales.

The sale of the *New York & Sea Beach* road has been postponed from March 20 to April 4, in order to give time to communicate with the bondholders.

The *Washington & Western* road will be sold in Alexandria, Va., April 4, under a decree of the Virginia Circuit Court. The road extends from Alexandria to Round Hill, 51½ miles. It was formerly the Washington & Ohio, and was sold under foreclosure Jan. 31, 1882, and then bought by the present company. Default having been made in the payment of installments of the purchase money, the re-sale has been ordered. The terms of sale require \$143,000 in cash, and the balance in three yearly installments.

Boston Railroad Club.

A call has been issued for a meeting to be held at the Quincy House in Boston on the evening of March 21, for the purpose of organizing a railroad club, and the discussion of subjects pertaining to railroad interests. Messrs. F. D. Adams, George Richards and J. W. Marden are the committee in charge.

Green Line Meeting.

A dispatch from Atlanta, Ga., March 21, says: "The Executive Committee of the Green Line met here to-day. The Committee adjusted and settled a large number of claims and disposed of a considerable amount of unfinished business. It then resolved itself into a conference committee and after discussion agreed to perpetuate and sustain the Green Line organization south of Chattanooga, which includes the Western & Atlantic Railroad, the Georgia Railroad and the South Carolina Railroad. The Central combination and its connections agreed to sustain the Green Line claims department and clearing-house. The Louisville & Nashville, the Nashville & Chattanooga and the Cincinnati Southern have withdrawn from the Atlanta clearing-house, carrying with them the roads that they control. The meeting adjourned to-night."

ELECTIONS AND APPOINTMENTS.

Addison & Northern Pennsylvania.—At a recent meeting of this company, the following directors were chosen: T. C. Platt, George R. Blanchard, R. G. Taylor, J. E. Jones, C. L. Pattison, Roscoe Conkling, H. P. DeGraaf, James Horton, W. S. Gurnee, Bird W. Spencer, J. D. Fish, J. W. Hammond, Wm. C. Sheldon. The board re-elected T. C. Platt, President; George R. Blanchard, Vice-President; S. H. Morgan, Secretary and Auditor; Wm. C. Sheldon, Treasurer; Frank M. Baker, General Superintendent.

Atchison, Topeka & Santa Fe.—The following circular is dated March 16: "Mr. W. J. Janney has been appointed Western Traveling Agent with headquarters at Topeka, Kansas. A. E. Lippincott, in addition to his present territory, will assume control of that formerly worked by Mr. Janney, with headquarters at 38 Arcade, Cincinnati, Ohio, and 318 Main street, Louisville, Ky."

Atlantic & North Carolina.—Major John S. Gatling has been appointed Receiver, and has taken possession of the road.

Bangor & Piscataquis.—This company has re-elected Moses Giddings President; Arthur Brown, Superintendent; H. W. Blood, Clerk and Treasurer.

Burlington, Cedar Rapids & Northern.—At the annual meeting recently the following directors were chosen: E. S. Bailey, Charles Bard, J. W. Blythe, John I. Blair, J. Carscadden, C. D. Close, Lyman Cook, J. N. Dewey, F. H. Griggs, C. Lynde, J. C. Peasley, C. P. Squires, J. Tracy. The board elected officers as follows: President, J. Tracy, Burlington, Ia.; Secretary, S. S. Dorwart, Cedar Rapids, Ia.; Treasurer, H. H. Hollister, New York; Assistant Treasurer, C. Stickney, Cedar Rapids, Ia.

M. H. Trusdell has been appointed Traveling Passenger Agent for this company, vice W. E. Decatur, deceased. Appointment to take effect this March 15.

Canada Southern Line.—Mr. E. T. Washburn has been appointed Cashier and Accountant of this fast freight line to succeed Mr. Smith, now of the Lackawanna Line. Mr. A. H. Hoffman succeeds Mr. Washburn as Chief Clerk. Mr. W. H. Alport is appointed Car Accountant.

Central, of Missouri.—At a meeting held in St. Louis, March 13, the following directors were chosen: R. A. Betts, James Edwards, J. A. Hall, M. Kotany, A. Singer.

Chesapeake & Ohio.—At the annual meeting in Richmond, March 15, the following directors were chosen: Williams C. Wickham, Richmond, Va.; John Echols, Staunton, Va.; John Castree, Isaac E. Gates, A. S. Hatch, Elias S. Higgins, C. P. Huntington, Abiel A. Low, A. E. Orr, Edward T. Tournier, Ezra Wheeler, New York. The only new director is Mr. Gates, who succeeds Jesse Hoyt, deceased.

The following order has been issued by General Manager C. W. Smith:

"Mr. C. H. Hudson has been appointed Superintendent of Transportation in charge of the train and station service of this road and branches, with headquarters at Richmond. The division superintendents will report to and receive their instructions from the Superintendent of Transportation."

Mr. Hudson has served on the Chicago, Burlington & Quincy, the Baltimore & Ohio and recently on the Minneapolis & St. Louis.

Chicago General Passenger Agents' Association.—At a meeting held in Chicago, March 15, the following officers were elected for the ensuing year: President, James Charlton; Vice-President, W. P. Johnson; Secretary, J. J. Byrne; Executive Committee, A. V. H. Carpenter, A. H. Hanson, and Percival Lowell. Mr. Charlton now begins his fifth consecutive term as President of the Association.

Chicago, St. Louis & Pittsburgh.—The directors of this company, successor to the Columbus, Chicago & Indiana Central, are as follows: Conrad Baker, Indianapolis; George Hoadley, Cincinnati; William L. Scott, Erie, Pa.; J. N. McCullough, Thomas D. Messler, Pittsburgh; Alfred L. Dennis, Newark, N. J.; John P. Green, George B. Roberts, Philadelphia; Charles J. Osborn, New York.

Chicago & Western Indiana.—Mr. G. W. Stokes has been chosen Treasurer in place of Roswell Miller, resigned.

Cincinnati, New Orleans & Texas Pacific.—Mr. Richard Carroll has been appointed Superintendent of the Cincinnati Southern Division, with office in Cincinnati. He has been connected with the road for some time, and Acting Superintendent for several months.

Columbus, Hocking Valley & Toledo.—Mr. A. C. Addy is appointed Car Accountant in place of George C. Mather, resigned.

East Tennessee, Virginia & Georgia.—Mr. W. V. McCracken, late Superintendent of the Georgia Division, has been appointed Assistant to the President.

Indianapolis & Evansville.—The following directors have been chosen: R. K. Dunkerson, W. D. Ewing, G. J. Grammar, Wm. Heitman, E. O. Hopkins, E. P. Huston, D. J. Mackey, Evansville, Ind.; Josephus Collett, Terre Haute, Ind.; James Woodward, New York. The road is now controlled by the Evansville & Terre Haute Co. The board elected D. J. Mackey President.

Kansas City, St. Louis & Chicago.—At the annual meeting in St. Louis, March 13, the following directors were chosen: N. J. Higgins, J. J. Mitchell, W. H. Mitchell, P. H. Rea, Thomas Shackelford, G. M. Shelley, George Straut, R. P. Tansey, John M. Woodson. The road is leased to the Chicago & Alton.

Mississippi, Terre aux Boeufs & Lake.—The officers of this company are: President, E. L. Carriere; Treasurer, P. Maspero; Superintendent, W. R. Spelman; General

Contractor, John R. Elder. The office is No. 9 Carondelet street, New Orleans.

New York Central & Hudson River.—Mr. John S. Burdett is appointed Paymaster in place of Charles Reed, resigned. Mr. E. W. Cadwell succeeds Mr. Burdett as Assistant Paymaster.

Old Colony.—With the promotion of Mr. J. R. Kendrick from Superintendent to General Manager of this road, the titles of the three assistant superintendents, J. H. French, in Boston; S. A. Webber, at Fitchburg (Northern Division), and C. H. Nye, at Hyannis (Cape Cod Division), have been changed to Division Superintendent.

Petroleum Railway, of Pennsylvania.—The officers of this company are: President, A. H. Steele; Vice-President, James F. Blair; Secretary, D. W. Lockhart; Treasurer, I. D. Stinson. Office in Titusville, Pa.

Pittsburgh, Cincinnati & St. Louis.—At the annual meeting in Columbus, O., March 20, the following directors were chosen: David S. Gray, Columbus, O.; George W. McCook, Robert Sherrard, Jr., Steubenville, O.; W. H. Barnes, J. N. McCullough, Thomas D. Messler, Wm. Thaw, Pittsburgh, Pa.; J. N. DuBarry, John P. Green, Henry H. Houston, Wistar Morris, George B. Roberts, J. Price Wetherill, Philadelphia.

St. Louis & San Francisco.—The new board has re-elected Edward F. Winslow, President; Charles W. Rogers, First Vice-President and General Manager; James D. Fish, Second Vice-President; T. W. Lillie, Secretary and Treasurer; George Butler, Assistant Treasurer.

Salina, Lincoln & Fremont.—The directors of this new company are as follows: J. M. Burks, Lincoln, Neb.; W. H. Dickinson, Wahoo, Neb.; G. W. E. Dorsey, Fremont, Neb.; S. C. Smith, Beatrice, Neb.

Savannah, Florida & Western.—At the annual meeting in Savannah, March 9, the following directors were chosen: H. B. Plant, M. K. Jesup, Henry Sandford, M. J. O'Brien, New York; H. S. Haines, J. H. Estill, W. S. Chisholm, Savannah, Ga. The board re-elected H. B. Plant President; W. S. Chisholm, Vice-President; H. S. Haines, General Manager; R. B. Smith, Secretary; W. P. Hardee, Treasurer.

Toledo, Cincinnati & St. Louis.—At the annual meeting in Toledo, O., March 20, the following directors (one-third of the board) were chosen: G. C. Moses, Bath, Me.; John McNab, Gloversville, N. Y.; Theodore Adams, Philadelphia; John Felt Osgood, Boston; George Wm. Ballou, New York.

Toledo & South Haven, St. Joseph Division.—The officers of this company are: President, John F. Wolf, Centerville, Mich.; Secretary, L. A. Clapp, Centerville, Mich.; Treasurer, Edward Martin, Paw Paw, Mich.; Superintendent, John Ihling, Lawton, Mich.

Traders' Dispatch.—Mr. Thomas N. Jarvis has been appointed General Manager of this fast freight line. He was recently with the Commercial Express Line.

Toledo, Cincinnati & St. Louis.—President E. B. Phillips will, for the present, act as General Manager in place of F. A. Phillips, resigned.

Vermont & Canada.—Mr. Albert Clark, formerly of St. Albans, Vt., but now of Boston, has been chosen a director and President in place of Francis A. Brooks, resigned.

Virginia Midland.—At a meeting held in Alexandria March 19, directors were chosen to fill the vacancies made by the resignation of the Baltimore & Ohio members of the board. The full board is now as follows: President, John S. Barbour, Alexandria, Va.; Directors, Joseph Bryan, A. S. Buford, T. M. Logan, Richmond, Va.; C. G. Holland, Danville, Va.; John T. Lovell, Front Royal, Va.; W. H. Payne, Warrenton, Va.; Robert T. Baldwin, Wm. Keyser, Skipwith Wilmer, Baltimore; M. Bayard Brown, Wm. P. Clyde, W. Bayard Cutting, John McAnerney, C. J. Osborn, George Parsons, John A. Rutherford, New York.

PERSONAL.

—Mr. Charles Reed, Paymaster of the New York Central & Hudson River road, has resigned his position to engage in other business.

—Mr. George R. Blanchard, Vice-President of the New York, Lake Erie & Western Co., sailed from New York for Liverpool March 17. He expects to remain abroad for several months.

—Mr. Charles H. Waters, a wealthy manufacturer of Groton, Mass., died in that town March 13, aged 54 years. He was for many years a director of the Worcester & Nashua Company.

—Col. G. Jordan, now Vice-President of the Houston & Texas Central Co., has been offered the position of General Manager of the Mobile & Ohio road, in place of Mr. A. L. Rives, who is going to the Virginia Midland.

—Mr. George C. Mather, Car Accountant of the Columbus, Hocking Valley & Toledo road, has resigned in order to accept the position of Assistant Treasurer of the Columbus & Hocking Valley Coal & Iron Company.

—Col. Orland Smith, recently General Manager of the Columbus, Hocking Valley & Toledo, and now President of the Cincinnati, Washington & Baltimore, and Third Vice-President of the Baltimore & Ohio, recently removed his residence from Columbus, O., to Cincinnati. On that occasion his friends in Columbus presented him with a very fine silver set.

—Mrs. Hester Van der Linde Brinkerhoff Jackson died in Newark, N. J., March 20, at the remarkable age of 101 years. She was mother of Mr. John P. Jackson (deceased), who was for many years Vice-President and Superintendent of the New Jersey Railroad, and grandmother of Mr. F. Wolcott Jackson, now General Superintendent of the United Railroads of New Jersey Division of the Pennsylvania Railroad.

—Mr. Francis A. Brooks has resigned his position as President and a director of the Vermont & Canada Co. Mr. Brooks has for years worked hard in every possible way to secure justice for the stockholders of his company, and to compel the Central Vermont to make some equitable settlement of their claims. He now retires, it is understood, in order to facilitate the conclusion of the compromise agreement, which gives them a small part of their dues.

—Mr. Isaac S. Waterman, for many years a merchant of Philadelphia, died in that city March 10, aged 79 years. In addition to his business in Philadelphia, he was largely interested in iron manufacturing, for a long time owning the Montour Iron Works. He was for several years a director of the North Pennsylvania Railroad Co., and held a large interest in that road. He was at one time the principal owner of the Rochester & State Line road, now the Rochester & Pittsburgh, and the completion of that road to Salamanca was chiefly due to his efforts.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Two months ending Feb. 28:

	1883.	1882.	Inc. or Dec.	P. C.
Alabama Great Southern.	\$185,889	\$127,375	L.	45.9
Central Pacific.	3,142,000	3,561,144	D.	11.7
Ches. & Ohio, Main Line.	494,439	387,760	L.	27.5
Elizabeth & N. E. & Big S.	55,528	55,561	L.	80.5
Des Moines & Ft. Dodge.	11,591	64,890	D.	35.8
Eastern.	515,450	424,238	L.	20.1
Grand Trunk.	2,787,383	2,515,301	L.	10.8
Gulf, Col. & Santa Fe.	295,600	182,029	L.	61.5
Houston, E. & W. Texas.	46,514	33,506	L.	27.8
Nash, Chattanooga & St. L.	362,851	341,727	L.	6.2
Net earnings.	174,244	136,975	L.	27.2
Oregon Ry. & Nav. Co.	649,300	682,673	D.	5.2
Peoria, Dec. & Evansville.	95,960	125,658	D.	23.5
Richmond & Danville lines:				
Charlotte, Col. & Aug.	164,727	185,243	L.	11.9
Net earnings.	83,054	46,335	L.	44.7
Columbia & Greenville.	166,662	147,810	L.	12.7
Net earnings.	77,824	58,431	L.	25.9
Rich. & Danville.	590,005	575,659	L.	2.5
Net earnings.	301,319	178,870	L.	40.4
Virginia Midland.	210,773	170,177	L.	19.5
Net earnings.	77,295	72,021	L.	7.3
Western N. E.	47,747	29,991	L.	60.7
Net earnings.	17,762	5,345	L.	70.5
St. Louis & Cairo.	49,288	56,150	D.	12.7
Vicksburg & Meridian.	95,847	94,321	L.	1.6
Month of January:				
Chl., Burlington & Quincy.	\$1,025,689	\$1,058,594	D.	3.2
Danbury & Norwalk.	17,777	13,417	L.	24.8
Month of February:				
Alabama Great Southern.	\$81,763	\$66,731	L.	18.5
Central Pacific.	1,424,000	1,720,575	D.	17.2
Ches. & Ohio, Main Line.	250,247	179,053	L.	28.6
Eliz. & N. E. & Big S.	55,193	55,757	D.	1.0
Des Moines & Ft. Dodge.	21,573	32,074	D.	32.9
Eastern.	270,168	265,213	L.	1.8
Gulf, Col. & S. F.	133,591	82,153	L.	38.2
Houston, E. & W. Texas.	21,460	15,290	L.	29.1
Nash, Chattanooga & St. L.	165,293	174,974	L.	5.8
Ohio & Mississippi.	294,960	294,159	L.	0.3
Oregon Ry. & Nav. Co.	391,700	284,284	D.	27.4
Peoria, Dec. & Evansville.	45,507	57,903	D.	21.4
Richmond & Danville lines:				
Charlotte, Col. & Aug.	94,108	74,437	L.	20.6
Net earnings.	9,615	77,272	D.	87.8
Columbia & Greenville.	329,247	286,021	L.	13.1
Rich. & Danville.	113,822	14,156	L.	87.6
Virginia Midland.	27,557	19,947	L.	27.2
Western N. E.	18,833	23,906	D.	21.3
St. Louis & Cairo.	44,709	43,012	L.	3.9
Vicksburg & Meridian.	90,460	79,959	L.	11.3
First week in March:				
Chl. & Grand Trunk.	\$59,613	\$37,094	L.	38.2
East Tenn., Va. & Ga.	69,238	52,732	L.	24.0
Norfolk & Western.	41,394	35,539	L.	13.9
Ohio Central.	16,385	12,490	L.	23.7
Second week in March:				
Chl., Milwaukee & St. P.	\$443,000	\$340,265	L.	23.2
Chl. & Eastern Illinois.	251,240	27,629	L.	89.1
Chl. & Northwestern.	441,000	355,900	L.	19.3
Chl., St. P., Minn. & Om.	91,200	96,450	D.	5.5
Denver & Rio Grande.	191,740	116,700	L.	39.0
Missouri Pacific Ind.	285,481	496,942	D.	42.5
St. L. & San Francisco.	83,400	59,706	L.	28.3
St. P., Minn. & Manitoba.	163,000	145,500	L.	11.9
Wabash, St. L. & Pa.	343,025	344,521	L.	0.4

* Deficit.

Grain Movement.

For the week ending March 10 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past seven years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1877.....	1,195,040	688,134	1,721,333
1878.....	2,377,784	2,566,123	3,385,861
1879.....	2,936,291	2,007,797	4,306,145
1880.....	3,778,365	2,593,052	4,234,824
1881.....	2,505,482	1,649,551	3,367,379
1882.....	1,072,086	1,590,487	1,619,473
1883.....	6,074,880	4,461,514	4,239,807

Thus the receipts of the Northwestern markets for the week were enormously greater than in the corresponding week of any previous year, and were no less than 4,372,000 bushels (257 per cent.) more than in the corresponding week of last year, when they were very small, however. They were nevertheless 457,000 bushels less than in the previous week of this year, though with that and another exception they are the largest ever known while navigation was closed.

The shipments of these markets were also vastly greater than ever before at this season and 180 per cent. more than in the corresponding week of last year. They were 360,000 bushels more than in the week before and were the largest since September. There were 738,069 bushels (16.5 per cent. of the whole) that went down the Mississippi, yet the rail shipments were the largest ever made in a single week.

The Atlantic receipts are also larger than in the corresponding week of any previous year, but only slightly larger than in 1880 and 1879. They were 2,620,000 bushels (160 per cent.) more than last year, but 626,000 less than in the previous week of this year. With that exception, however, they were the largest since November.

While there was a decrease of 457,000 bushels in the Northwestern receipts, there were none of any importance except at Toledo and Peoria, whose receipts were extraordinary the week before.

Among Atlantic ports Baltimore and New Orleans show a large falling-off from the week before, but no other places.

Exports from Atlantic ports for the week to March 14 have been:

	1881.	1882.	1883.
Flour, bbls.....	148,441	128,014	125,096
Grain, bu.....	3,975,208	1,611,739	2,174,275

Thus while the exports were somewhat more than last year, they were much less than in 1881.

For the week ending March 17 receipts and shipments at Chicago and Milwaukee were:

	Receipts.	Shipments.
Flour, bbls.....	178,714	159,772
Grain, bu.....	3,216,882	1,110,730

The enormous increase over last year might be accounted for by the very light movement last year; but comparison with other years shows that the movement is now unprecedented.

For the week ending March 17 receipts at four Eastern ports have been:

Bushels:	New York.	Boston.	Phila.	Balt.	Total.
1883.....	1,729,288	483,900	428,050	931,459	3,570,697
1882.....	631,957	215,385	95,050	127,436	1,069,828
1881.....	1,411,532	373,830	584,550	1,167,856	3,537,768

P. C. of total:	1883.	1882.	1881.
New York.....	48.4	13.6	11.9
Boston.....	50.1	20.1	8.9
Phila.....	39.9	16.6	16.5
Balt.....			33.0
Total.....	100.0	100.0	100.0

Philadelphia and Baltimore together have 38 per cent. of the whole this year, against 20.8 last year and 49.5 in 1881. The total receipts being slightly more than in 1881, Philadelphia received 27 per cent. less and Baltimore 20 per cent. less, but New York 22½ per cent. and Boston 30 per cent. more.

Coal.

Coal tonnages for the week ending March 17 are reported as follows:

	1883.	1882.	Inc. or Dec.	P. C.
Anthracite.....	392,426	371,773	L.	5.6
Semi-bituminous.....	94,529	92,513	L.	2.2
Bituminous, Penna.....	72,808	53,356	L.	26.4
Coke, Penna.....	50,040	64,493	D.	14.3

The anthracite companies have decided to resume work on full time. Probably this will not make very much difference in the total output.

Coke tonnages continue to show a considerable decrease, but the bituminous trade generally shows considerable improvement over last year.

Cumberland coal tonnage for the week ending March 10 was 31,224 tons. The total tonnage this year to March 10 was 325,629 tons.

The coal tonnage of the Pennsylvania Railroad for the week ending March 10 was:

	From line of road.	From other roads.	Total.
Coal.....	138,692	42,208	180,900
Coke.....	42,570	7,470	50,040
Total.....	180,662	49,678	230,340

The total tonnage this year to March 10 was 2,308,977 tons; 1880, 2,078,683; increase, 230,294 tons, or 11.1 per cent.

Mr. John H. Jones, Official Accountant, makes the following statement of anthracite coal tonnage for February and the two months to Feb. 28:

	February.	1882.	Two months.	1882.
1883.	1882.	1883.	1882.	
Phila. & Read.....	475,143	364,287	940,656	772,654
Lehigh Valley.....	401,388	337,753	832,966	696,969
Central of N. J.....	280,320	229,246	584,813	493,518
Del., Lack. & W.....	308,627	260,942	646,887	532,456
Del. & Hud. Canal Co.....	194,861	187,339	442,587	409,740
Pennsylvania R. R.....	165,161	136,031	327,318	302,023
Penna. Coal Co.....	90,551	66,839	193,304	163,025
N. Y., L. E. & W.....	21,036	22,827	45,210	48,769

Increase for the month, 332,753 tons, or 20.7 per cent.; increase for the year, 574,585 tons, or 17.7 per cent. All the companies show gains except the Erie.

February tonnage of the Lehigh Valley includes 5,402 tons from the State Line & Sullivan road. In addition to the February tonnage credited to the Delaware & Hudson Canal, that company transported 39,279 tons from mines, which is included in tonnage of other interests.

The stock of coal on hand at tidewater shipping points Feb. 28, was 575,695 tons, a decrease of 41,064 tons during the month.

Cumberland coal shipments for the week ending March 17, were 33,416 tons. The total shipments this year to March 17, were 359,038 tons. Shipments by the Chesapeake & Ohio Canal began during the week, 2,091 tons going that way.

Coal receipts at San Francisco for the two months ending Feb. 28 were 107,460 tons, against 156,780 tons for the corresponding period last year; a decrease of 49,320 tons, or 31.4 per cent.

The first car-load of coal from the Pocahontas mines, on the New River division of the Norfolk & Western road, reached Norfolk, Va., on March 17. Its arrival was celebrated by a salute and formal celebration. The company presented the coal to the Mayor for distribution to the poor of the city.

Chicago coal receipts for the ten months from May 1 to Feb. 28 were:

	—Anthracite.—		—Bituminous.—	
	1882-83.	1881-82.	1882-83.	1881-82.
By lake.....	629,385	565,161	274,908	284,431
By rail.....	389,415	410,019	2,219,065	1,856,553
Total.....	1,018,800	975,180	2,493,973	2,140,984
Per cent. by rail.....	38.2	42.1	80.0	86.7

The total receipts for the ten months this year were 3,512,773; last year, 3,116,164; increase, 396,609 tons, or 12.7 per cent.

The Southwestern Railway Association, and the Kansas City, Fort Scott & Gulf.

In consequence of the attempt of the Kansas City, Fort Scott & Gulf to open a new freight line between Kansas City and St. Louis in connection with the St. Louis & San Francisco, the following circular was issued by Commissioner Midgley, of the Southwestern Association, on March 6:

"Withdrawal of through rates and divisions on business to and from points on the Kansas City, Fort Scott & Gulf road:

"On and after March 15 ensuing all through rates and divisions now in effect with the Kansas City, Fort Scott & Gulf Railroad on both east and west bound business will be withdrawn, and all freights to or from points on or east of the Mississippi River coming from or destined to points on that road will be subject to the established local tariff rates of this Association to or from Kansas City.

The above will cancel the through rates to Fort Scott, Paola and Parsons, Kan., shown in joint freight tariff No. 1, westward bound, dated Jan. 1, 1883; also the through rates from these points as shown in joint freight tariff No. 2, eastward bound, of same date.

In response to this circular General Freight Agent M. L. Sargent, of the Fort Scott road, issued the following circular to agents under date of March 9:

"All through rates and divisions via Kansas City, Paola, Fort Scott and Lamar, to or from Chicago, St. Louis or other Mississippi River points and East will be void on and after March 15.

"You will not name any through rates or give any bills of lading by these routes after Saturday, March 10, inst.

"All through rates and divisions via Nichols will remain in effect, and all business for St. Louis and East must be loaded and routed that way. Notify all shippers and others interested.

"On and after March 15, inst., our local tariff rates will apply on all business to and from Kansas City, whether local or through.

"Remember that full rates will be charged by all lines east of Kansas City, Paola, Ft. Scott and Lamar on all business not delivered to them on or before the 14th inst., and you must see that all your through business billed at present divisions of the through rates is delivered by that time.

"Kansas City will continue to bill at our proportion of the through rate on and after the 15th any business in transit that was billed out by connecting lines prior to March 15, at their proportion of through rate.

"Agents will at once interview all shippers, explaining this order, and solicit their business via Nichols and request them to so order goods routed. We can and will make as good time via Nichols as has been made via Kansas City or other junction points from Chicago, St. Louis and all points East. Goods should be ordered 'Care St. Louis & San Francisco Railway, St. Louis.'

"The Association withdraws percentage divisions to punish

this line for opening a St. Louis line, and we trust our friends will feel enough interest to order via Nichols and thus assist us in showing that shippers on our line are not entirely at the mercy of this foreign pool association.

"Order 'Frisco cars for grain for St. Louis or East.'

Nichols, four miles from Springfield, Mo., is the point of junction with the St. Louis & San Francisco road. After these preparations for war a meeting was held at which it is reported that the roads in the Association agreed to pay the Fort Scott and the St. Louis & San Francisco companies a certain sum, in consideration of which they give up the Kansas City business.

Rates on Immigrants' Movables.

At a meeting held last week in Chicago there were present representatives of the lines from Chicago to St. Paul, the St. Paul, Minneapolis & Manitoba and the Northern Pacific. The rates on immigrants' movables from Chicago, Burlington, Rock Island, Moline, Clinton, etc., to places of location in the territories, were determined as follows: From Chicago and the cities above mentioned to Fargo and Jamestown, \$70 per car; to Crookston and Grand Forks, \$73; to Bismarck, \$80; Glendive, \$115; Miles City, \$155; Billings, \$140; St. Vincent, \$75; and to Livingston, \$160, or from \$12 to \$35 per car less than the rates heretofore enforced. From Peoria, St. Louis, Beardstown, Quincy, Hannibal, and from other points of embarkation to Fargo the rate was fixed at \$80 per car, with a proportionate increase to more distant places, and the same rate, \$80, from St. Louis, etc., to St. Vincent.

A Fast Freight Line to Manitoba.

Arrangements have been completed for the organization of a fast freight line to run between Toronto, Ont., and Winnipeg, Manitoba, over the Credit Valley, the Canada Southern and Michigan Central, the St. Paul, Minneapolis & Manitoba and the Canadian Pacific roads.

St. Louis, Minneapolis & St. Paul Short Line.

Officers of the Minneapolis & St. Louis, the Burlington, Cedar Rapids & Northern, the Chicago, Burlington & Quincy, and the St. Louis, Keokuk & Northwestern railroads in conference in Burlington, Ia., March 21, decided to re-establish the fast passenger line between St. Paul, St. Louis and Minneapolis and Lake Minnetonka and St. Paul, to be called the St. Louis, Minneapolis & St. Paul Short Line. It was formerly known as the Iowa route. This arrangement goes into effect April 1.

RAILROAD LAW.

New Jersey Railroad Taxation.

The New Jersey Senate has defeated both the bills for the taxation of railroad property, one of which had already passed the House. These bills have been the subject of much discussion, and have excited a great deal of interest throughout the state. A joint resolution has been passed providing for a commission, to consist of the Attorney-General and two others, to draft a railroad tax law to be submitted to the Legislature next year.

Express and Railroad Companies.

A dispatch from Portland, Or., March 19, says: "Judge Deady, of the United States Circuit Court, to-day granted a provisional injunction in the case of Wells, Fargo & Co. against the Oregon Railway & Navigation Co. He held that Wells, Fargo & Co. were duly incorporated; that the express business is a recognized branch of the carrying trade, and the railway was bound to rate it accordingly; that the railroad corporation was created by the state to serve the public as a common carrier for reasonable compensation, and must adjust itself to the usage and custom of trade, and that the Oregon corporation act only authorizes collection of reasonable tolls by the railroad companies and is a contract with the state to that effect, and what constitutes reasonable tolls is for the court to decide. In each case the Court directed that the plaintiff should pay the defendants the same compensation as heretofore."

Contracts for Division of Territory.

In the suit of the Denver & New Orleans Co. against the Atchison, Topeka & Santa Fe Co., the United States Circuit Court at Denver holds that the contract between the defendant company, the Union Pacific and the Denver & Rio Grande for a division of territory to the exclusion of other roads is against the public interest, and cannot be sustained by law. The Court therefore decrees that the defendant must receive passengers and freight from the plaintiff at the junction of the two roads, and must receive passengers and freight at other points to be delivered to plaintiff's road at the junction. The rates to be charged on passengers and freight interchanged must not be greater than those charged on business exchanged with the Denver & Rio Grande at the same point. Further than this the Court dismisses so much of plaintiff's bill as prays the Court to fix rates and prescribe the apportionment of rates between the roads.

The Law Regulating the Transportation of Live Stock.

In the cases of the United States against the Boston & Albany and the Fitchburg Railroad Co. suit was brought to recover penalties under the following section of the revised statutes:

"No railroad company within the United States whose road forms any part of a line of road over which cattle, sheep, swine or other animals are conveyed from one state to another, or the owners or masters of steam, sailing or other vessels carrying or transporting cattle, sheep, swine or other animals from one state to another shall confine the same in cars, boats or vessels of any description for a longer period than 28 consecutive hours without unloading the same for rest, water and feeding for a period of at least five consecutive hours, unless prevented from so unloading by storm or other accidental causes. In estimating such confinement the time during which the animals have been confined without such rest on connecting roads from which they are received shall be included, it being the intent of this section to prohibit their continuous confinement beyond the period of 28 hours, except upon contingencies heretofore stated."

The penalty prescribed is a fine of not less than \$100 nor more than \$500 for each offense.

The companies having interposed demurrers on two grounds the United States District Court in Boston has overruled the demurrers on the first ground, holding that the law is clearly constitutional and the companies within its provisions. The second ground of demurrer was that the penalty sued for is not the penalty imposed by the statute, and on this the Court holds that the confinement of the entire number of animals for a longer period than 28 consecutive hours without unloading for rest, water and feeding, is a single offense, for which the defendants are made liable to the penalty. By no fair construction of the

OLD AND NEW ROADS.

Addison & Northern Pennsylvania.—A contract has been let for a branch line which is to run from this road at Davis station, near Gaines, Pa., southeast through Ben Gully to some coal mines. This branch will be about 6 miles long. Work is to be begun at once and finished in 30 days.

Arkansas State Railroad Bonds.—At a meeting held in Philadelphia last week the holders of the repudiated Arkansas state bonds resolved to proceed actively against the railroads upon which the bonds constitute a lien, under the recent decision of the United States Circuit Court. They will therefore ask at once for the appointment of receivers for the Little Rock & Fort Smith, the Little Rock, Mississippi River & Texas and the Memphis & Little Rock roads.

Atlantic & North Carolina.—Under the order recently granted by the North Carolina Circuit Court, the Court has appointed Major John Gatling Receiver, pending further action in the suit to set aside the lease of the road to the Midland North Carolina Co. The Receiver has taken possession of the road.

Augusta & Knoxville.—At a recent meeting of the board the Finance Committee was authorized to confer with the stockholders and bondholders, and to endeavor to make some satisfactory arrangement in relation to the unpaid January coupons. The Committee was also authorized to receive proposals for the sale or lease of the road.

Bangor & Piscataquis.—At the annual meeting in Bangor, Me., March 21, the stockholders voted to authorize the directors to take all necessary steps to build the extension of the road to Moosehead Lake.

Bedford, Springville, Owensboro & Bloomfield.—The Indianapolis Rolling Mill Co., as owner of this road by purchase at judicial sale, has organized the Bedford & Bloomfield Railroad Co. The road is a narrow-gauge line, extending from Bedford, Ind., westward 41 miles to Switz City. Its business has been very light, chiefly it is said, on account of the want of friendly connections.

The Indianapolis Rolling Mill Co. is not anxious to keep the road, and has been for some time trying to negotiate a sale. It is understood that the road was offered to the Pennsylvania Company some time ago.

Boston & Albany.—This company has completed at Boston a milk depot 350 by 28½ ft. and four stories high. A track enters the first story, from which trains can be unloaded into 80 ice chests, each chest holding 80 cans. Ten elevators lift the milk to the second story, which is level with the streets, whence 30 wagons can receive their supply at once through as many doors. In the upper story it is proposed to start a creamery, where any surplus milk will be made into butter.

Boston, Hoosac Tunnel & Western.—The sale of the franchises, right of way, and all other property of this company west of Schenectady, N. Y., to the New York, West Shore & Buffalo Co. has been finally completed. The price paid is said to be \$400,000 cash, and \$700,000 West Shore stock. A short piece of track connecting the two roads near Schenectady is to be built at once. The agreements between the two companies included a co-tract for interchange of traffic to and from New England points.

Boston & Lowell and Concord.—In the New Hampshire Supreme Court, March 16, a decision was given in the case of the state, on complaint of Pearson, against the Concord Railroad Co. The Court held that the arrangement under which the Concord and Boston & Lowell railroads have been operated recently was partly legal and partly illegal, although the decision sustained the management completely in all important matters: that neither stockholders, Concord Corporation, nor the public had been in any way injured; that the directors acted on the advice of eminent counsel, in good faith and with a desire to conform to law, and had been guilty of no substantial misconduct; but that stockholders of the Concord Railroad could not be compelled to have receipts from local business mingled with local business of the Boston & Lowell Railroad, and divided by the same rule of equitable division which the division of through business was properly governed by. The conclusion arrived at was that in this respect it was not in conformity with the opinion delivered upon the contract first entered into between the Concord and the Boston & Lowell, and to that extent it was in violation of the injunction. A nominal fine of \$1 was imposed.

The agreement having been terminated by mutual consent, this decision has now no practical effect.

Boston & Maine.—The directors have issued a circular to the stockholders, in which, after referring to past troubles with the Eastern road, they speak of the proposed lease of that road as follows:

"Some of the advantages may be pointed out for your information and guidance. The lease places at once under your control, lands, yards, storehouses and deep water facilities in Boston, which have been long needed, and for the want of which the business of your road has seriously suffered. It removes not only the necessity for the expenditure of several millions of dollars for lands for increased depot and freight facilities in Boston, but it obviates the necessity for raised tracks and other costly devices for facilitating and meeting the growing traffic of your road. The control of the Eastern road affords direct and easy communication with the White Mountains, and removes the necessity for the expenditure of large sums of money in opening new avenues to secure this traffic, which is growing in importance every year. It also gives direct connection with all the popular summer resorts, not only on the coasts of Eastern Massachusetts and New Hampshire, but on those reached by cars and steamboats on the coast of Maine. These seashore resorts, as the country increases in wealth and population, are to become important factors in our traffic resources, and we can hardly overestimate the importance of avoiding all costly contests in competing for this business.

"It is obvious to all intelligent men that the two roads, placed under one management, must result in a great saving in operating expenses.

"The saving will, indeed, be much greater than is supposed possible by those who are not familiar with the interests and management of the roads. The numerous ways in which important savings can be made have been carefully considered and estimated, and it may be stated that it is certain the aggregate is a sum which will contribute materially to the resources of the roads without diminishing the traffic facilities, or in any way interfering with the rights and interests of the public.

"The matter of public rights, conveniences and interests, as involved in the lease, is one upon which there need be no anxiety felt by communities or individuals. It may be stated that not only will patrons doing business with either road be as well accommodated and as favorably considered as in the past, but it is confidently expected that by reason of important saving in expenses, improved facilities will be

afforded on the lines of the roads, and even more favorable terms made to shippers and travelers.

"It would, indeed, be a short-sighted policy for the lessees to change or diminish freight or passenger trains, add to cost of transportation, or in any way obstruct or render burdensome to patrons the service of the different roads.

"The history of the consolidation and leasing of competing roads, both in this country and in Europe, conclusively proves that such acts have uniformly resulted in better train facilities, and in lower or more just traffic terms to patrons. The leasing of the Eastern Railroad by your road will certainly not form an exception to a general rule.

"The terms of the lease have been cautiously considered by your directors, and every provision has been subjected to prolonged discussion, with the view of guarding and protecting your interest for the present and prospectively.

"It will be noticed that in the various provisions of the document there is no one which imposes upon your road guarantees of any of the debts of the Eastern road. You assume none whatever of the obligations of the leased road; you become in no way involved in its pecuniary affairs, or interested in its bonded stock or floating debts. All your obligations are confined to paying the interest on the funded or fixed debts of the corporation, at the rate of 6 per cent. per annum, and paying over to the stockholders certain portions of the net earnings of the joint roads, after paying 9 per cent. dividends on your own stock and the interest on the funded debt of your road.

"Your directors are unanimously of the opinion that the terms, conditions and obligations of the proposed lease are safe, and that under no circumstances likely to arise, can its provisions result otherwise than for your immediate and prospective benefit."

Burlington & Sheldon.—There is some talk in Vermont of the building of a railroad from Burlington, nearly parallel to the Central Vermont, to St. Albans, and thence to Sheldon Junction, about 50 miles in all. The project is said to be backed by the Southeastern, of Canada.

Canada Southern.—A dispatch from Washington, March 20, says: "The Attorney-General has rendered an opinion on the proposition of the Canada Southern Railroad to bridge Niagara River. The Canadian Parliament authorized the building of such a bridge when similar permission was given by Congress or the President. The Attorney-General says that Congress has done nothing in the matter and that the President has no authority to grant the necessary permission."

Carson & Colorado.—Track on this road has now been laid from the late terminus at Benton, Col., southward 15 miles, and the grading is finished for 15 miles further.

Central Vermont.—The Boston Advertiser of March 18 says: "The long pending negotiations between the various parties interested in the Vermont Central and Vermont & Canada railroads, for a termination of their differences, are still going forward, and there is reason to hope for a final and satisfactory settlement within a few days. It having been represented by some persons that the Hon. Francis A. Brooks, President of the Vermont & Canada, was obstructing the progress of the plan, Mr. Brooks, at a meeting of the directors of that company, a day or two ago, resigned as President and director, for that reason and others personal to himself. The directors reluctantly accepted his resignation, tendering him a complimentary vote, and elected Col. Albert Clarke President. They also passed, as they have before done, votes in furtherance of the scheme of settlement, and approved the draft of a mortgage of both roads, as agreed upon by the counsel of both corporations. There now seems to be no disagreement anywhere, and this action of the Vermont & Canada people places it in the power of the Central Vermont management to complete the reorganization without delay."

Central, of New Jersey.—The old report of a lease of this road to the Philadelphia & Reading Co. has been revived. It has not been denied by the Reading party, but its truth is denied by authority of Receiver Little. Two things certainly appear to be against the report. The lease could hardly be made while the Central remains in possession of the court, and there seems to be no immediate prospect of a termination of the receivership. Moreover the Reading is at present in no position to make the guarantees which the Central stockholders would be likely to require. The lease is possible, but does not seem to be imminently probable.

Chesapeake & Ohio.—At the annual meeting, March 15, the stockholders voted to approve the action of the directors in guaranteeing the bonds of the Newport News Elevator Co.; also to approve an issue of \$3,000,000 bonds for the purpose of building branch lines and improving terminal facilities, and to authorize the board to build branches where necessary to reach mines, furnaces, etc., such spurs and feeders not to exceed 20 miles each in length.

This company has lately received four new Pullman sleepers, which are to be put on the road shortly, and which will run between Cincinnati and Newport News without change during the summer.

Chicago, Rock Island & Pacific.—The track of the Kookuk & Des Moines Division from Des Moines, Ia., to Ottumwa is now being relaid with steel rails of the company's standard pattern.

Chicago & Northwestern.—Notice is given that at the annual meeting in June the stockholders will be asked to vote on the consolidation of the Chicago, Milwaukee & Northwestern and the Elgin & State Line companies with this company. Both of these are proprietary roads, the Chicago & Northwestern owning all the stock, and the consolidation will be purely formal, and will simply dispense with the necessity of keeping up the separate organizations. The company's policy has for several years been to absorb the proprietary organizations as fast as can be conveniently done.

Cincinnati & Eastern.—A contract has been let to Stephen Feike, of Cincinnati, for all the work needed to complete the road to Portsmouth, O. The work is to be finished by July 1.

The track is now laid to Mineral Springs, 5 miles eastward from the late terminus at Peebles and 77 miles from Cincinnati. Trains begin running to the new terminus this week.

Cincinnati, New Orleans & Texas Pacific.—This company is organizing a fast freight service for the special purpose of carrying fruit and vegetables from Southern points to Cincinnati and other northwestern cities. A number of cars have been prepared especially for this traffic.

Columbus, Chicago & Indiana Central.—The bondholders who bought this road at foreclosure sale have organized the Chicago, St. Louis & Pittsburgh Railroad Co., and the necessary certificates have been filed in Ohio, Indiana and Illinois. The organization will be completed in a short time. The capital stock of the company is \$30,000,000, and a mortgage for \$22,000,000 has been executed, as provided in the agreement of reorganization. The new company is entirely under Pennsylvania control.

Delaware & Hudson Canal Co.—The United States & Canada Express has contracted with this company for the local business on its leased Albany & Susquehanna Railroad. It is intended to connect at Binghamton with the Delaware, Lackawanna & Western Express, and thus cover the territory of Southern New York to Buffalo, and also to reach all the principal points in Pennsylvania. From Albany the company will, as formerly, use the Hoosac Tunnel line to Boston. The National Express and the Erie & New England Express have heretofore operated over the Albany & Susquehanna road.

Grand Rapids & Indiana.—A dispatch from Grand Rapids, Mich., March 21, says: "The Pennsylvania Railroad Co. to-day presented a bill in the Circuit Court of Kent County asking for an injunction against the Grand Rapids & Indiana Railroad Co., to restrain the latter from paying the interest maturing on April 1 on its bonded debt secured by the mortgage of Oct. 1, 1869, until it has paid the interest coupons on bonds secured by the same mortgage, previously maturing, purchased and held by the Pennsylvania Railroad Co., amounting with interest to \$2,315,000."

The Pennsylvania Railroad Co. has paid these coupons under an agreement made some years ago, by which it agreed to pay them as they matured and to hold them until Jan. 1, 1883. The present application is probably the forerunner of a suit in foreclosure.

Hannibal & St. Joseph.—A dispatch from Kansas City, March 18, says: "Judge Cravens, Special Master in Chancery, yesterday made a report to Judge McCrary, in United States Circuit Court, in the Hannibal & St. Joseph bond case. The Master was appointed to report upon the amount of indebtedness remaining due to the state on account of the bonds issued by the latter in aid of the road. The railroad company has paid into the state treasury \$2,000,000. The Master reports that on Jan. 1, 1883, there was due the state for unpaid interest from the railroad company the sum of \$549,000. The report now awaits the action of the presiding Judge."

Huntingdon & Broad Top Mountain.—This company has created a car trust to the amount of \$120,000, bearing 6 per cent. interest and payable in ten yearly installments. The Girard Life Insurance & Trust Co., of Philadelphia, is trustee. The trust is made for the purpose of buying coal cars, 250 of which have been ordered.

Indianapolis & Evansville.—This road, which has track laid from Washington, Ind., to Petersburg, 18 miles, and a little grading done besides, has been sold to D. J. Mackey, who represents several gentlemen interested in the Evansville & Terre Haute and the Chicago & Eastern Illinois roads. Under the new management the road will probably be extended to a connection with the Evansville & Terre Haute, but it is not at all likely that the original plan of extending it to Indianapolis will be carried out.

International.—Work has been begun on this road in Maine, near the Quebec border. The contracts let call for the completion this year of the road from the present terminus at Lake Megantic, P. Q., to the Maine state line, about 15 miles, and of a section of 20 miles in Maine.

International, of Florida.—The Jacksonville (Fla.) Union-Times says: "Gen. John B. Gordon arrived in this city yesterday to direct the future great railway enterprise of which he is the official head. To-morrow morning a large force of hands will be put to work at different points on the line of the International Railway & Steamship Co.'s Railroad, between this city and Palatka, under the management and direction of experienced railroad builders.

"At the same time the work will be continued from Tampa to some point on the Peninsular Railroad, now finished to Wildwood, so as to give the city of Tampa and that section of the state an outlet by way of the western portion of the International road and the already completed lines of other companies to Jacksonville, the purpose being to give the people of the Tampa Bay country a line of transportation sooner than could be given by building the entire line from Jacksonville to Tampa. This does not change in any degree the original plan of a line from Jacksonville to Tampa and Key West, all of which will be put in process of construction at an early day."

Iron Mountain & Helena.—The United States Circuit Court has given judgment against this road for \$29,000 in favor of A. H. Johnson, who built 18 miles of the line, and has decided that, under the contract, Mr. Johnson is entitled to possession of the road until his claim is paid. The road was sold to the St. Louis, Iron Mountain & Southern Company some months ago, and is now operated by that company.

Memphis, Selma & Brunswick.—Work is progressing steadily on this road, and track is reported laid for 12 miles westward from Holly Springs, Miss. The grading is well advanced toward Memphis.

Marquette, Houghton & Ontonagon.—Contracts have been let for the grading of the remaining 21 miles of the extension from L'Anse, Mich., to Houghton, and work has been begun. On the section first let the work is advancing well.

Mexican Railroad Notes.—The following items are from the latest number of the *Mexican Financier*.

On April 2, anniversary of the battle of Puebla, Yucatan will witness the inauguration of two new lines of railway: one from Merida to Uman, on the Calkini line, and the other from Merida to Conkal, which is the first section of the through line to Progreso.

The Mexican Central has been extended 40 miles south of Chihuahua, but work is delayed by the non arrival of material for bridges. The company has submitted to the government a plan of route northward toward Santa Rosalia, so as to touch that city, and also to avoid building a heavy and expensive bridge required on the original route.

Durango advises state that engineers are now in the field to fix the definite line of the Sinaloa & Durango road from Culiacan to the port of Mazatlan. The line will probably be run via Cieneguita, Puerta de Santa Maria, Ojinapa and La Borrega, dividing at this point via Cosala for Culiacan and via San Ignacio for Mazatlan. The government inspectors have already accepted 40 miles of the road.

The International Railroad Co. is said to have abandoned its projected route to Monterey, passing through Linares and Montemorelos. It will build from Laredo direct to Ciudad Victoria and thence to the City of Mexico, running branch roads to the most important points.

Official reports on the Lampazas & Cosahuila Division of the Mexican National state that the new iron bridge at Morales is about finished, and a similar structure is building at Topo and another at Salinas. The formal opening of the road to Garcia will take place as soon as the station houses at Santa Catarina and Garcia are finished and the telegraph line completed.

Michigan Central.—Surveys have been completed for the proposed branch from Beaver Lake, Mich., on the Mackinaw Division, to Alpena, which will be about 70 miles long.

A contract has been let to H. W. Sage & Co., for grading 25 miles of this branch, their contract beginning at Beaver Lake.

Notice is given that the 8 per cent. equipment bonds, which mature April 1, will be paid on and after April 2, on presentation at the office of the Farmers' Loan & Trust Co. in New York. Interest will cease from maturity. There were \$558,000 of these bonds outstanding by the latest report.

Mississippi, Terre aux Boeufs & Lake.—We have received the following statement from this company:

"This company was organized under a state law by citizens of New Orleans and vicinity. It is virtually a rebuilding of the old Mexican Gulf road, whose right of way, road-bed and franchises it acquired by purchase. The latter road was built in 1838-40, laid with flat rail, and was worked up to the war, when the rails were taken to be used in building iron-clad confederate rams. The road will be 30 miles long, extending from Elysian Fields, in New Orleans, to Lake Borgne, on the Gulf of Mexico. The survey is now completed; the line runs 3½ miles through the city, thence south on the left bank of the Mississippi 15 miles to English Bend, whence it runs east to Lake Borgne. Grading is now progressing, with a good force, about 4 miles next the city being completed. After that the ties are all contracted for and about 30,000 on the ground. The grade the entire distance is less than 5 ft. The line of the old road is changed to get on the high lands near the river, and to run near the sugar houses, of which there are 20 on the line. The land is the rich alluvial sandy soil deposited by the river. On the levee are large vegetable gardens and orange groves, to supply the New Orleans and Northern markets. The company has bought a large tract of land on the lake front, to make an attractive summer resort, with salt breezes and surf-bathing, the nearest and most accessible to the city. The capital stock of the company is \$200,000, the bonded debt \$8,500 per mile. The road will be completed and in running order by September next. The road will be ballasted with shell, of which there are great quantities at the lake terminus. Among the improvements at Lake Borgne will be a pier, accessible for vessels drawing 8 ft. of water, and from which fruits and tropical vegetables can be loaded on cars for Northern markets."

Nahant Branch.—It is proposed to build a railroad from the Eastern road at Revere Beach, Mass., by Long Beach, Nahant Beach and Little Nahant to Nahant. The road will be about 4½ miles long, and will give access by rail, although necessarily by a circuitous route, to a popular summer resort, which is now only accessible from Boston by water.

Nashville, Chattanooga & St. Louis.—This company's statement for February and the eight months of the fiscal year from July 1 to Feb. 28 is as follows:

	February.	Eight months.
Earnings.....	\$195,263	\$1,574,184
Expenses.....	106,336	872,025
Net earnings.....	\$88,927	\$702,159
Interest and taxes.....		433,929
Surplus.....		\$268,230

For the eight months there was an increase of \$135,199, or 9.4 per cent., in gross earnings; a decrease of \$8,932, or 1.0 per cent., in expenses; an increase of \$144,131, or 25.8 per cent., in net earnings, and an increase of \$131,611, or 96.8 per cent., in surplus earnings.

New York Central & Hudson River.—A curious suit against this company is now on trial in New York. The plaintiff, Dr. John W. Green, seeks damages for the depreciation in value of his property, which faces on the company's St. John's Park freight station in New York. His complaint alleges that, in consequence of the building of this station and the use of the adjoining streets by the company, the annual rental of his property has decreased from \$6,500 to \$2,500, and estimates the damage done to him at \$74,000. The defense set up that the park was given to the property owners on the bounding streets as a public square by Trinity Church Corporation, with a provision that if Trinity Church wished to dispose otherwise of the property and obtained the written consent of two-thirds of the lot-holders it might do so; that in 1866 this consent was obtained and the property sold to the railroad company for \$1,000,000, one-half of which was received by the property owners. In the year 1867 the company erected its depot. The case will probably last several days.

New York, Lake Erie & Western.—It is reported that this company is negotiating for the lease of the Tonawanda Valley & Cuba, the Bradford, Eldred & Cuba and the Bradford, Bordell & Kinzua roads. These narrow-gauge roads, which are all under the same management, have a total mileage of 155 miles in Southwestern New York and in the Bradford oil district in Pennsylvania, and connect with the Erie at Attica, Cuba, Wellsville and Bradford. They have so far been very profitable, but their future value, like that of all roads in an oil country, is somewhat uncertain.

Surveys are being made for the proposed Oatka Valley Branch, which will run from LeRoy, N. Y., to Gainesville, about 25 miles, through the lately discovered salt-well region. The line will be parallel to the Rochester & Pittsburgh, on the opposite side of the Oatka Valley.

New York, Philadelphia & Norfolk.—This company has executed and recorded mortgages to secure proposed issues of \$1,650,000 first-mortgage bonds and \$1,600,000 income bonds on the projected road down the Eastern Shore of Virginia from the Maryland line to Cherrystone.

New York, West Shore & Buffalo.—It is said that the principal repair shops of this road will be built about half way between the villages of Lion and Frankfort, N. Y., some 11 miles east of Utica. The people of those villages have subscribed \$30,000 for the purchase of land for the shops.

North Carolina, Cleveland & Chattanooga.—This company has filed articles of incorporation to build a railroad from Chattanooga, Tenn., eastward through Cleveland to the North Carolina line at the point where the Hiwassee River crosses it. The distance is about 60 miles.

Northern Pacific.—Track is now laid to Bozeman, Montana, 10 miles westward from the last point reported and 1,050 miles from St. Paul. The tracklaying will proceed steadily westward, the temporary switchback being used to pass trains until the completion of the Bozeman tunnel. It is expected that the tunnel itself and the Mullan tunnel will both be completed by the time track is laid on the gap between the eastern and western ends of the track, which is now about 280 miles.

A contract has been let to H. F. Clark, of New York, and Winston Brothers, of Minneapolis, Minn., for the completion of the track from the present end of track on the Clark's Fork Division eastward to Helena, Montana, a distance of about 150 miles, including all the work except the Mullan tunnel. This is the last contract to be let on the

main line, the work east of Helena being already under contract.

A contract has been let for the grading and bridging of the branch line from Livingston, Montana, southward into Yellowstone National Park. The work on this branch will be light. It will be about 60 miles long, and the terminus in the Park will be at the Mammoth Hot Springs.

Northwestern Minnesota & Red River Valley.—This company has filed articles of incorporation in Minnesota, to build a railroad from the Northern Pacific at Brainerd northward to the northern boundary of the state. The distance is about 160 miles. The capital stock is fixed at \$5,000,000. The incorporators are E. J. Fallon, Edgar Smith, A. C. Wall, J. C. Laabee, A. C. Tulley, George M. C. Taylor, S. G. Primrose, George H. Cook and A. B. Paine, all of New York.

Oregon & California.—At a meeting held at London, March 17, the preferred stockholders voted unanimously to approve the lease of the road to the Oregon & Transcontinental Co. The lease is for 999 years, the lessee agreeing to pay as rental interest on the bonds, \$20,000 yearly for organization and office expenses, and 2½ per cent. on the preferred stock yearly, until July 1, 1896, by which time it is expected that the road will be completed. After that date the rental is to be 35 per cent. of gross earnings, the lessee guaranteeing an amount sufficient to pay interest, organization fund and at least 2 per cent. on the preferred stock. The lessee further agrees to complete the extension of the road southward to meet the Central Pacific at the California line, about 195 miles, in as short a time as possible, and is to receive in payment \$20,000 per mile in first-mortgage bonds and \$10,000 per mile in second-mortgage bonds.

Pennsylvania.—Sealed proposals will be received until March 31, at the office of William H. Brown, Chief Engineer, No. 233 South Fourth Street, Philadelphia, for the grading, masonry and ballasting of the Philadelphia, Norristown & Phoenixville Branch from Manayunk to Soapstone Quarry, 2.6 miles.

The committee appointed at the annual meeting to select directors to be voted for at the annual election next week, has recommended the re-election of the present directors. It is not probable that there will be any opposition ticket.

The Philadelphia Ledger says: "The work on the Pennsylvania Railroad lines up the Schuylkill Valley is pushed vigorously, thousands of laborers being now engaged on both sides of the Schuylkill from Hestonville to Norristown. The work above Norristown is ready to begin. These are the lines of the Philadelphia, Norristown & Phoenixville and the Phoenixville, Pottstown & Reading Railroads, which are to be double track roads throughout, and all the work first-class in every respect. The route taken is the following: Commencing in Hestonville at the Pennsylvania Railroad's main line, near Fifty-second street, the new road will ascend the ravine west of Fairmount Park to the city line, near Montgomery avenue, and will run through Lower Merion township, Montgomery County to West Manayunk, where the Philadelphia & Reading Railroad, the Schuylkill River, and Schuylkill Navigation Co.'s canal, and the Philadelphia, Germantown & Norristown Railroad are all crossed by the high bridge which was fully described in the Ledger a few days ago. Entering into the city again at Manayunk the road passes through High street. It will continue between Jackson and Washington streets up along the Schuylkill River, to the city line at the Soapstone Quarries, thence back to Hamilton's paper mill to the bluff above Lafayette station, by Hiltner's furnaces, Spring Mill, through Conshohocken, crossing the Plymouth Railroad on an overhead bridge, thence along the bluff above the Norristown Railroad to near Potts station, reaching Lafayette street, Norristown, which it occupies from Ford to Barbadoes streets. Then crossing the Stony Creek Railroad overhead and running alongside the Schuylkill River to the Perkiomen, which it crosses on a high bridge, after which it crosses the Perkiomen Railroad to Quinceville, where the Schuylkill River is crossed by an arch-bridge, reaching Phoenixville, where connection is made with the branch line to Frazer. Crossing the ridge above the Reading Railroad by a tunnel 1,000 ft. in length, it reaches the river at Spring City and runs up on the west bank of the Schuylkill, cutting off several bends of the river. It then crosses the Schuylkill to the east bank, which it follows, passing through Pottstown, to a point near Douglassville, where it recrosses the river to the west bank, to Monocacy and Birdsboro, passing near Poplar Neck, from which point it reaches Reading, which is the terminal station."

Pennsylvania, Slatington & New England.—The Court has appointed a special master to take testimony in the suits between this company and the Wind Gap & Delaware, to determine their respective rights in the track between Bangor, Pa., and Penargyl. The master will proceed with his work and the case will come up before the Court again next month.

Petroleum Railroad, of Pennsylvania.—At a meeting held in Titusville, Pa., last week, the organization of this company was completed, and it was resolved to execute a mortgage to secure an issue of \$500,000 bonds. The company is successor to the Pennsylvania Petroleum Co., which graded a part of the line from Titusville to Erie over ten years ago.

Philadelphia & Atlantic City.—The parties now controlling this road desire to secure a better terminus on the Delaware than the present one in Camden, N. J., and better ferry connections with Philadelphia. It is said that land has been offered the company at Cooper's Point, and it is understood that negotiations have been opened for the use of the Camden, Gloucester & Mt. Ephraim tracks and terminus at Kaighn's Point.

Philadelphia & Reading.—The report of the Receiver, as audited by the Special Master and presented to the Court for January, is as follows:

	Railroad Co.	Coal & Iron Co.
Cash, Jan. 1.....	\$431,819	\$5,685
Receipts from all sources.....	2,747,568	1,098,938
Total.....	\$3,179,387	\$1,104,623
Disbursements.....	3,172,198	1,085,576

Cash, Feb. 1..... \$7,189 \$19,947

The balance held as a special deposit on account of the deferred income bond issue was \$12,034 at the close of the month.

The old covered wooden bridge over the Schuylkill at Norristown was destroyed by fire on the evening of March 15. It was over 90 years old, and formed the connection between the main line and the Germantown & Norristown Branch, all the main line trains running to the station at Ninth and Greene Streets, in Philadelphia using it. It will be replaced at once by a temporary structure (now nearly finished, and an iron bridge will be built hereafter).

Suits have been begun to recover from this company claims amounting to about \$117,000 for materials and labor furnished for the construction of the Schuylkill & Lehigh road, now controlled and worked by this company.

At a special meeting of the stockholders of the Schuylkill

Navigation Co. in Philadelphia, March 20, the proposition to merge the company in the Philadelphia & Reading, which has now a lease of its property, was presented. The proposition was to give one share of Reading stock and \$4 cash for two shares of Schuylkill Navigation preferred and one share of Reading and \$4 cash for each share of common stock. After a long and excited discussion, the proposition was laid on the table. A resolution ordering legal proceedings begun to recover rental due was cut off by an adjournment.

The Receiver's statement for February, as audited by the Master and submitted to the Court, is as follows:

	Railroad Co.	Coal & Iron Co.
Cash, Feb. 1.....	\$7,189	\$19,947
Receipts from all sources.....	2,561,836	988,179
Total.....	\$2,569,045	\$1,007,224
Disbursements.....	2,450,628	954,618

Cash, Feb. 28..... \$118,417 \$52,008

This, with the January statement given above, closes the cash account of the Receiver. The Special Master will shortly file his final report giving a statement of the closing audit and the transfer of the road to the company.

Richmond & Danville.—The earnings of this road and its controlled lines for February and the two months ending Feb. 28 were as follows:

	February		Two months	
	Gross.	Net.	Gross.	Net.
Rich. & Dan	\$329,248	\$183,593	\$589,005	\$301,319
Virginia Midland.....	113,822	50,575	210,773	77,205
Char. Col. & Aug.....	94,109	58,783	164,727	93,054
Col. & Greenville.....	95,615	60,570	166,092	77,824
Western N. C.....	27,557	12,741	47,647	17,762

Total..... \$690,351 \$366,202 \$1,178,844 \$567,264

For February the total earnings of all the lines show an increase of \$115,485, or 21.2 per cent. gross, and of \$185,313, or 102.4 per cent. net. For the two months the increase was \$122,944, or 11.6 per cent., in gross earnings, and \$265,929, or 87.0 per cent., in net earnings.

Rochester & Pittsburg.—Track on the Buffalo Division is now laid from the junction with the main line at Ashford, N. Y., north by west to the Cattaraugus viaduct, a distance of 14 miles. About half the iron work on the viaduct is finished, and it is expected that trains will cross it in about two weeks. On the Buffalo end track is now laid to Colden, 18 miles from Buffalo, leaving a gap of about 12 miles to be completed. On this most of the grading is done.

St. John & Maine.—A dispatch from Bangor, Me. March 16, says: "President Jackson, General Manager Tucker, Directors Sewall, Hyde and Strickland, of the Maine Central Railroad, and J. Murray Kay and Supt. McLeod, of the St. John & Maine Railway, and other parties from St. John and St. Andrews, held a consultation in Bangor to-day. The proposed railroad bridge at St. John, N. B., was given consideration, and it was determined to commence building the bridge at once. The cost is estimated to be about \$600,000."

Salina, Lincoln & Fremont.—This company has been organized to build a railroad from Fremont, Neb., southward to Lincoln, and thence south by west to Salina, Kan., about 190 miles in all. The object or necessity of such a line is not clearly apparent.

Texas & Pacific.—A dispatch from Washington, March 17, says: "More than a year ago the New Orleans Pacific Railway Co. applied to the Secretary of the Interior for transfer to itself of land granted to the New Orleans, Baton Rouge & Vicksburg Railroad Co., by act of Congress, approved March 3, 1871, presenting at the same time satisfactory proofs of the transfer as between the two companies. Secretary Teller delayed action in expectation that Congress might legislate upon the subject matter thereof. But that body having adjourned without action, and there being no reason for further delay, the application was referred to the President. In making the reference the Secretary says: 'In view of the facts and law of the case, I regard the New Orleans Pacific Railway Co. as the lawful assignee of the New Orleans, Baton Rouge & Vicksburg Railroad Co., and entitled to the lands granted by the twenty-second section of the act of March 3, 1871, to the said latter named company, and to the patents therefor, in so far as it has earned, or hereafter may earn, the same under that act, with the exception below named, and recommend that you accept 328 miles of said road, less and exclusive of 68 miles of the line of said New Orleans, Baton Rouge & Vicksburg road, extending from New Orleans to Whitecastle, between New Orleans and Shreveport (to which 68 miles the New Orleans Pacific road has withdrawn its claim and right to receive lands under the twenty-second section of said act), and that patents for such lands as may have been earned by construction be issued to the New Orleans Pacific Railway Co. (exclusive, nevertheless, of lands along the said 68 miles), on their compliance with the law and regulations in such case made and provided. These patents, will, of course, be subject to rights acquired by any person or corporation prior to the act of March 3, 1871.'

"The President to-day returned the papers in the case, with his approval of the recommendations made by the Secretary. This action in favor of the New Orleans Pacific road (now owned and operated by the Texas Pacific Railway Co.) is final."

Tidewater Pipe Line.—A dispatch from Meadville, Pa. March 16, says: "Judge Church this morning read his decision in the case of the Tidewater Pipe Line Co. against Satterfield and others. All the points raised in the case were decided in favor of the plaintiff. The result is to secure in control of the Tidewater the old board of managers—namely: A. W. Ferrin, B. D. Benson, Franklin B. Gowen and James R. Keene. As it was rumored that the Standard Oil Co. was back of the Satterfield party, this decision is a defeat for that corporation, as it confirms the control of the managers opposed to the Standard Oil Co."

Toledo & South Haven.—A company has been organized to build what is known as the St. Joseph Division of this road, extending from Lawton, Mich., southeast by Leesburg and Centreville to Nottawa on the Grand Rapids and Indiana road. The distance is about 30 miles.

Warren & Farnsworth Valley.—Track on this road is now laid to Vandegrift, Pa., 1¼ miles beyond the late terminus at Garfield, and 11¼ miles from Clarendon. Trains are running to the new terminus.

Western, of Alabama.—Since the purchase of this road some years ago by the Central, of Georgia, and the Georgia companies, it has been held by the two companies as joint owners and managed by a board containing an equal number of members appointed by each company. At a meeting held last week it was decided to capitalize the ownership and issue \$3,000,000 stock, one-half to each company. The change will make no difference in the relations of the road, of course, but the stock will appear in the assets of the two companies in place of the one-half share in the road.